ORDER NO. MKE0201001C1

B3

Service Manual

Video Cassette Recorder

PV-V462 / PV-V4602 / PV-V4622 / PV-V4612S / PV-V4022-K / PV-V4522-K / PV-V4612-K

SPECIFICATIONS

ITEM	SPECIFICATION	1	2	3	4
Power	Source: 120 V AC±12 V AC, 60 Hz±3 Hz	○	○	○	○
	Consumption: Approx. 18 W (Power on), Approx. 2.5 W (Power off)	○	–	–	–
	Approx. 23 W (Power on), Approx. 3.0 W (Power off)	–	○	○	○
Video	Head: 4 rotary heads helical scanning system	○	○	○	○
	Input Level: VIDEO IN Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced Output Level: VIDEO OUT Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced Signal-to-Noise Ratio: SP: more than 43 dB LP/SLP: more than 41 dB Horizontal Resolution: Color/Monochrome: more: SP: 230 lines LP/SLP: 220 lines	○	○	○	○
Audio	Head: Normal Mono: 1 stationary head	○	○	○	○
	Hi-Fi Stereo: 2 rotary heads	–	○	○	○
	Input Level: AUDIO IN Jack (Phono type) -10 dBv 50 kΩ unbalanced	○	○	○	○
	Output Level: AUDIO OUT Jack (Phono type) -8 dBv 600 Ω unbalanced	○	–	–	–
	AUDIO OUT Jack (Phono type) -8 dBv 1 kΩ unbalanced	–	○	○	○
	Frequency Response: Normal Mono: SP: 100 Hz-8 kHz	○	○	○	○
	LP: 100 Hz-6 kHz	○	○	○	○
	SLP: 100 Hz-5 kHz	○	○	○	○
	Hi-Fi Stereo: SP/LP/SLP: 20 Hz-20 kHz	–	○	○	○
	Signal-to-Noise Ratio: Normal Mono: SP: more than 42 dB	○	○	○	○
	LP/SLP: more than 40 dB	○	○	○	○
	Hi-Fi Stereo: SP/LP/SLP: more than 60 dB	–	○	○	○
	Wow and Flutter: Normal Mono: SP: Less than 0.2 % WRMS	○	○	○	○
	LP: Less than 0.3 % WRMS	○	○	○	○
	SLP: Less than 0.4 % WRMS	○	○	○	○
	Hi-Fi Stereo: Less than 0.015 % WRMS	–	○	○	○

ITEM	SPECIFICATION	1	2	3	4
RF Out	CH 3/CH 4 switchable 72 dBμ (open voltage) 75 Ω unbalanced	○	○	○	○
Tuner	Broadcast Channels: VHF 2~13, UHF 14~69 CABLE Channels: Midband A through I (14~22) Superband J through W (23~36) Hyperband AA~EEE (37~64) Lowband A-5~A-1 (95~99) Special CABLE channel 5A (01) Ultraband 65~94, 100~125	○	○	○	○
Video Signal	EIA Standard (525 lines, 60 fields) NTSC Color Signal	○	○	○	○
Tape Speed	SP: 1-5/16 i.p.s (33.35 mm/s), LP: 21/32 i.p.s (16.67 mm/s),	○	○	○	○
	SLP: 7/16 i.p.s (11.12 mm/s)	○	○	○	○
	Record/Playback Time: 8 hr. with 160 min. type tape used in SLP mode	○	○	○	○
	FF/REW Time: Less than 2-1/2 min. (120 min. type tape)	○	○	○	–
	FF/REW Time: Less than 1-1/6 min. (120 min. type tape)	–	–	–	○
	*Note: FF/REW Time may be exceed specification according to tape condition.				
Tape Format	Tape width 12.7 mm (1/2 inch) high density tape	○	○	○	○
Operating Condition	5 °C-40 °C (41 °F-104 °F) (Temperature) 10 %-75 % (Humidity)	○	○	○	○
Dimension (W x H x D)	360 mm x 93 mm x 242 mm (14-3/16 inch x 3-11/16 inch x 9-9/16 inch)	○	○	–	–
	430 mm x 98 mm x 242 mm (16-15/16 inch x 3-7/8 inch x 9-9/16 inch)	–	–	○	○
Weight	2.5 kg (5.5 lbs.)	○	○	–	–
	2.7 kg (6.0 lbs.)	–	–	○	○

1. PV-V4022-K
2. PV-V4522-K
3. PV-V462/ PV-V4602/ PV-V4612S/ PV-V4612-K
4. PV-V4622

Weight and dimensions shown are approximate.
Designs and specifications are subject to change without notice.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

1. SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these criticalparts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

2. **An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personalinjury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing.**
3. **When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.**
4. **After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.**
5. **After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.**

LEAKAGE CURRENT COLD CHECK

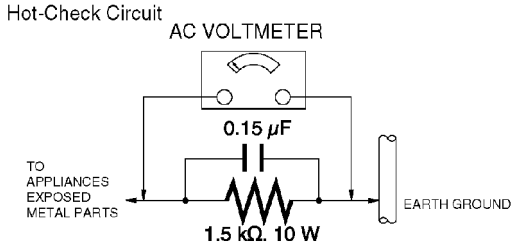
1. **Unplug the AC cord and connect a jumper between the two prongs on the plug.**

2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to thechassis, the reading should be between 1 M Ω and 5.2 M Ω . When the exposed metal does not have a return path to the chassis, the reading must be infinity.

LEAKAGE CURRENT HOT CHECK
(See figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5 k Ω , 10 W resistor, in parallel with a 0.15 μ F capacitor, between each exposed metallic part on the set and a good earth ground, as shown in figure 1.
3. Use an AC voltmeter, with 1 k Ω /V or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks. Leakage current must not exceed 1/ 2 mA. In case a measurement is outside of thelimits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

Figure 1



2. PREVENTION OF ELECTRO-STATIC DISCHARGE

(ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits, some field-effect transistorsand semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. **Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, whichshould remove electrostatic charge for potential shock reasons prior to applying power to the unit under test.**
2. **After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.**
3. **Use only a grounded-tip soldering iron to solder or unsolder ES devices.**
4. **Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.**
5. **Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.**
6. **Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparableconductive material).**
7. **Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.**

   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD)sufficient to damage an ES device).

"NOTE to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding systemof the building, as close to the point of cable entry as practical."

3. OPERATION GUIDE

4. SERVICE NOTES (PLEASE READ)

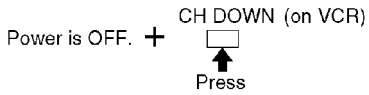
4.1. SERVICE NOTES

4.1.1. SIMPLIFIED FAULT FINDING DATA

implified Self-Diagnostic System facilitates finding the cause of the fault. A 3-digit fault code will be displayed in F.I.P.
The Simplified Fault finding data is stored in the Memory IC (IC6005). This data is cleared after it is displayed, and then the POWER button is pressed back on.

1. With power turned off, press CH DOWN button on VCR (for over 3 seconds if VCR is not in shut off condition).

Fig. 1-1



2. Fault code (3-digit number) will be displayed in F.I.P. as shown.

Fig. 1-2

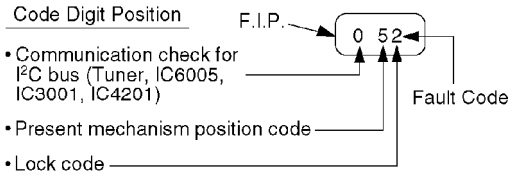


Fig. 1-3

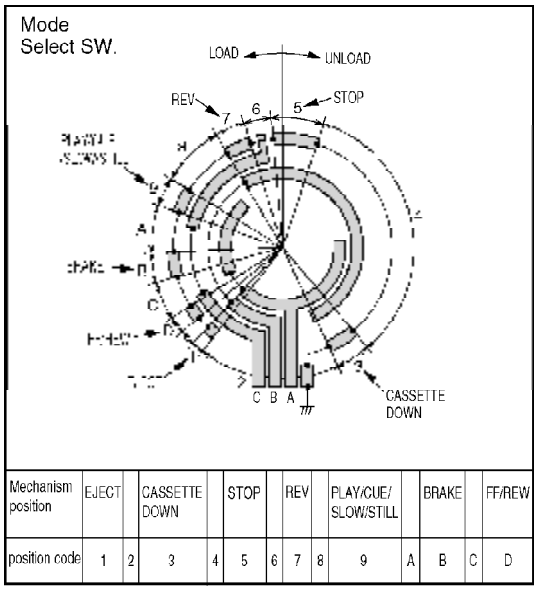
Explanation of Codes	Code No.		
Communication check for I²C bus (Tuner, IC6005, IC3001, IC4201) (Refer to Fig. 1-4.)	0 to F		
Present Mechanism Position Code Mechanism Position is indicated. (Refer to Fig. 1-5.)		1 2 3 4 5 6 7 8 9 A B C D	
Lock Code (See Note) • VCR is not in shut-off condition. • Reel lock. • Cylinder lock. • Exceeds loading/unloading time. (Mechanism Lock) • Exceeds Cassette loading/unloading time. (Cassette Lock)			0 1 2 3 4

Fig. 1-4

Communication check for I²C bus (IC6001◄►Tuner)	Communication check for I²C bus (IC6001◄►IC6005)	Communication check for I²C bus (IC6001◄►IC3001)	Communication check for I²C bus (IC6001◄►IC4201)	Code No.
OK	OK	OK	OK	0
			NG	1*
		NG	OK	2
			NG	3*
	NG	OK	OK	4
			NG	5*
		NG	OK	6
			NG	7*
NG	OK	OK	OK	8
			NG	9*
		NG	OK	A
			NG	b*
	NG	OK	OK	C
			NG	d*
		NG	OK	E
			NG	F*

Note:
For Normal Audio (Mono) models, ignore "Communication check for I²C bus (IC6001◄►IC4201)" and odd code Nos. (those with*) will not be displayed in F.I.P.

Fig. 1-5



Mechanism position	EJECT		CASSETTE DOWN		STOP		REV		PLAY/CUE/ SLOW/STILL		BRAKE		FF/REW
position code	1	2	3	4	5	6	7	8	9	A	B	C	D

3. When 1 to 4 listed in Lock code occurs, Lock data will be stored in the Memory IC (latest Lock data only).

Note:

1. Lock data will be kept after the AC Cord is unplugged.

2. When 1 to 4 listed in Lock code occurs for the first time, the VCR does not go into VCR shut-off condition. If it occurs again within a minute, the VCR goes into VCR shut-off condition. Then, the VCR stops and all VCR function buttons exceptfor power become non-operational.

3. Lock data will be cleared at the first power on operation after lock code is displayed in FIP.

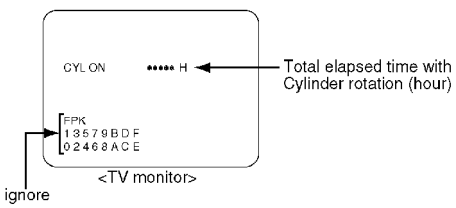
4.1.2. USAGE SCREEN MODE

Function displayed on the TV monitor:

- the total elapsed ”Cylinder rotation ”time (in hours)

1. With power turned on and no cassette, press CH DOWN button on VCR and 7 key on remote together.
(The USAGE SCREEN will be displayed on the TV Monitor.)

Fig. 2



Note:

1. **After replacing the Cylinder Unit, press COUNTER RESET button on remote in this mode. Total elapsed "Cylinder rotation" time (in hours) will be cleared to 0.**
2. **To release from Usage Screen Mode, press any operation button on VCR or insert a cassette tape in this mode. The VCR will return to normal operation mode.**

4.1.3. EEPROM IC (IC6005), MAIN C.B.A. REPLACEMENT NOTE

After replacing EEPROM IC (IC6005) or Main C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.

4.1.4. SERVICE POSITION

4.1.4.1. Service Position

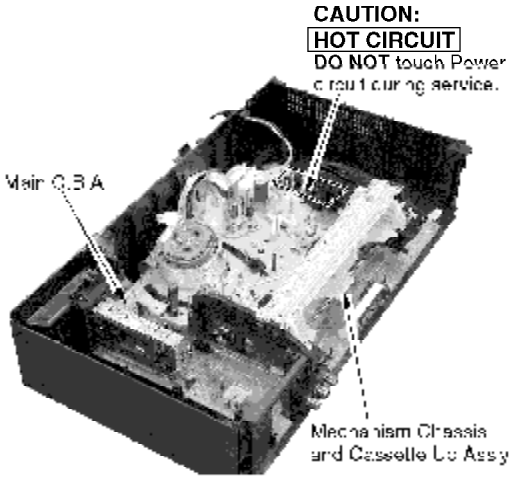
Service Position	Purpose
Service Position (1)	Mechanism check Mechanical adjustment Electrical adjustment
Service Position (2)	Main C.B.A. check

CAUTION:

HOT CIRCUIT (Primary circuit) exists on the Main C.B.A.
Use extreme care to prevent accidental shock when servicing.

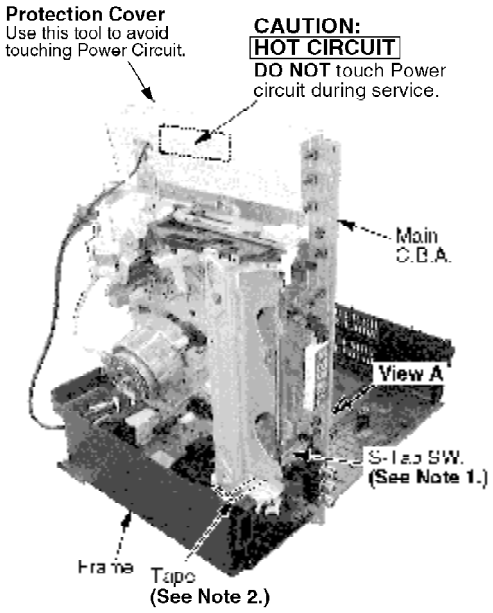
4.1.4.1.1. Service Position (1)

Fig. 3-1



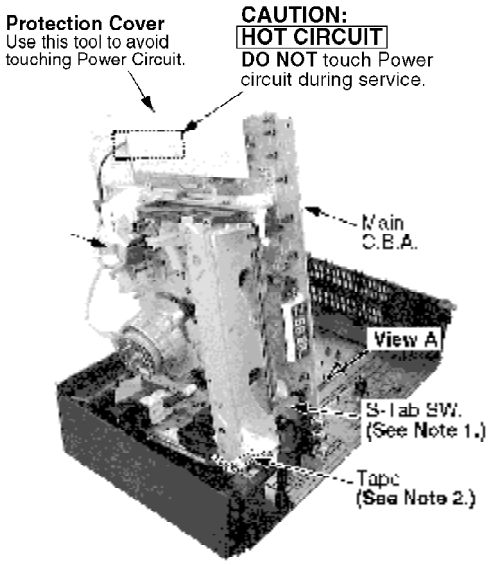
4.1.4.1.2. Service Position (2-1)
(Normal Frame Model)

Fig. 3-2-1



4.1.4.1.3. Service Position (2-2)
(Wide Frame Model)

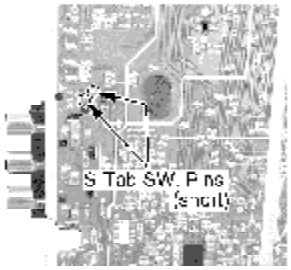
Fig. 3-2-2



Note:

1. It is possible that the S-Tab SW. may not work correctly in Service Position (2-1), (2-2). (Recording can not be done). In this case, short the S-Tab SW. Pins on the foil side of the Main C.B.A. to turn this SW. on.

Fig. 3-3



Main C.B.A. (foil side)
View A

Alternative method:
Cover the S-Tab SW. with masking tape.

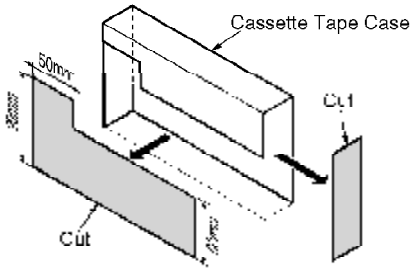
2. Place the tape between the Cassette Up Ass'y and Main C.B.A. to get a stability.

Fig. 3-4

To avoid touching Power Circuit,
following Tool (**Protection Cover**) is recommended.

How to make the Protection Cover:

1. Cut a Cassette Tape Case as shown.



2. Cover the Power Circuit portion on Main C.B.A. with it.

Note:
The Protection Cover is not supplied.

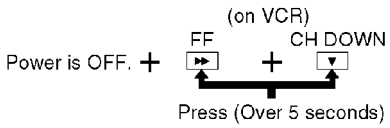
4.1.5. HOT CIRCUIT

Primary circuit exists on the Main C.B.A.
This circuit is identified as "HOT" on the C.B.A. and in the Service Manual. Use extreme care to prevent accidental shock when servicing.

4.1.6. SERVICE MODE

In order to inhibit detection of the Supply & Takeup Photo Transistors, Reel Sensor, and Cylinder Lock, press and hold FF button and CH DOWN buttons on VCR together over 5 seconds in power off condition.

Fig. 4-1



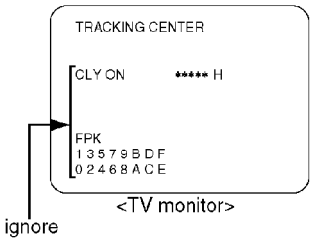
The power comes on and the unit goes into service mode.
In this mode, Mechanism movement can be confirmed. When removing Cassette Up Ass'y, it can be confirmed without a cassette.

To release from this mode, press POWER button off or disconnect AC Plug.

4.1.7. TRACKING CENTER MODE (TRACKING FIX AT CENTER)

Insert the Cassette tape. Set the unit into Service Mode. Play back the Cassette tape. Press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor. In this mode, the tracking is fixed at center. (Auto tracking and manual tracking functions are not operational.)

Fig. 4-2



To release from this mode, press PLAY or STOP button.

4.1.8. CAUTION FOR INSTALLATION OF FRONT PANEL ASS'Y

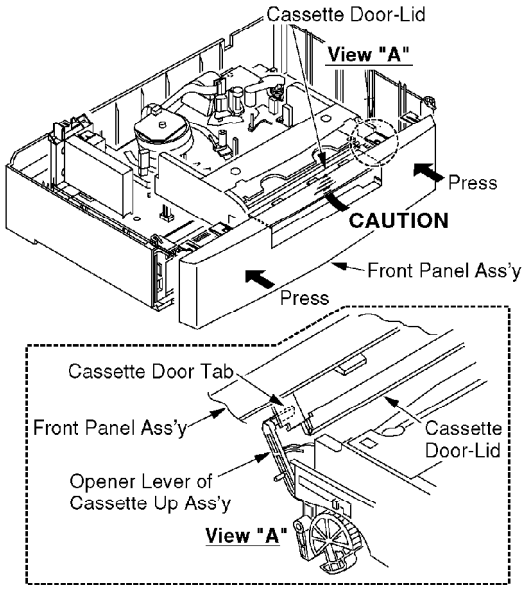
CAUTION:

Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.

Install the Front Panel Ass'y as follows:

1. **Swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.**
2. **Make sure that all locking tabs are aligned properly. Then, press the Front Panel straight in.**

Fig. 5



4.1.9. METHOD FOR LOADING/UNLOADING OF MECHANISM

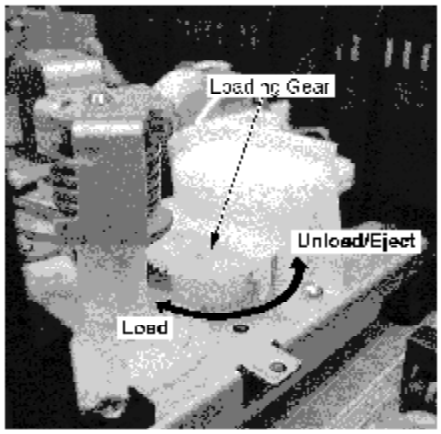
4.1.9.1. (Manual Method)

Turn the Loading Gear clockwise (for loading) or counterclockwise (for unloading) using needlenose pliers etc.

Note:

Do not use this method if Mechanism is jammed or locked.

Fig. 6-1



4.1.9.2. (Electrical Method)

Apply +10.0 V DC Power Supply to the Loading Motor terminals.

Loading

DC + to Portion "a," DC - to Portion "b"

Unloading

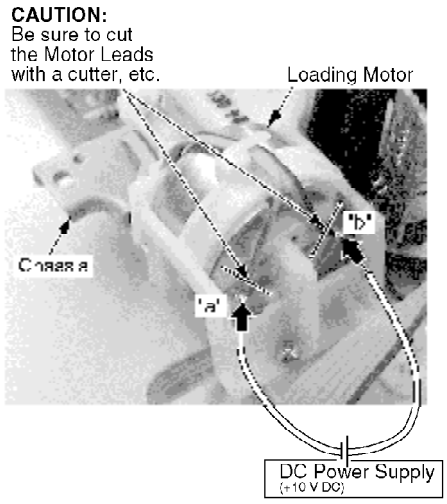
DC - to Portion "a," DC + to Portion "b"

CAUTION:

Before applying DC Power Supply, be sure to cut the Motor Leads with a cutter, etc.

Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.

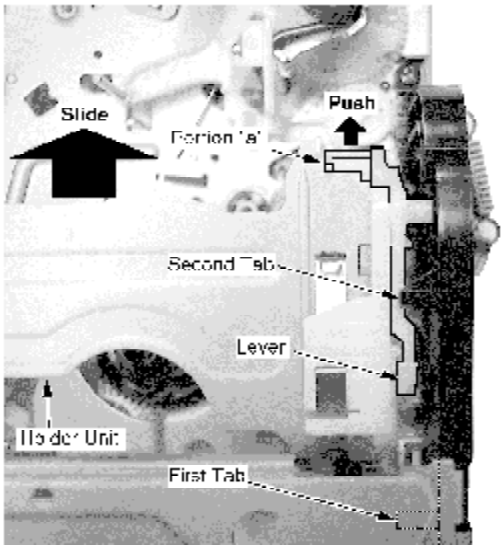
Fig. 6-2



4.1.9.2.1. WHEN LOADING WITHOUT A CASSETTE

When loading without a cassette, push Portion "a" on the Holder Unit of Cassette Up Ass'y so that the Lever clear the First Tab and Second Tab.

Fig. 6-3



4.1.10. HOW TO REMOVE A JAMMED TAPE

CAUTION:

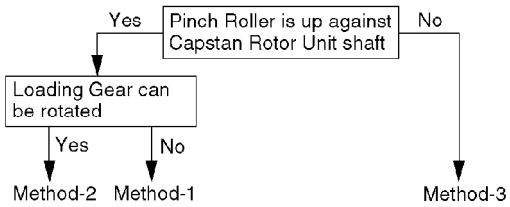
Wiper Arm Unit may be damaged or its spring may be out of place when the jammed tape is removed by force.

Remove a jammed tape as follows:

4.1.10.1. Manual Method

When a tape jam is encountered, check the tape loading condition and use the following procedure to remove a tape jam.

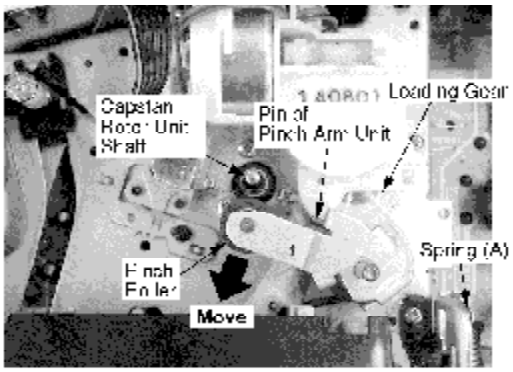
Fig. 7-1



Method -1:

1. Move the Pinch Roller Unit out by unhooking the Pin of Pinch Arm Unit so that the Pinch Roller is separated from the Capstan Rotor Unit shaft.

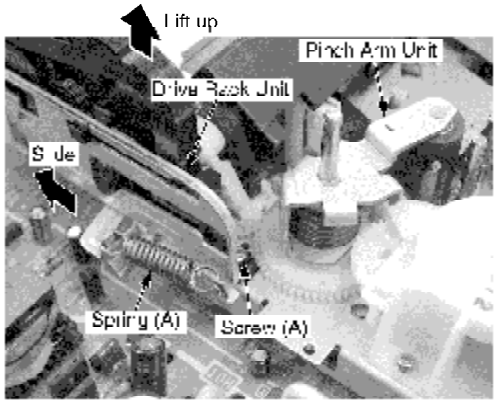
Fig. 7-2



Top View

2. **Remove the tape from the tape path.**
3. **Rewind the tape into the cassette by rotating the Center Clutch Unit counterclockwise.**
4. **Unhook Spring (A) of the Drive Rack Arm.**
5. **Remove Screw (A).**
6. **Lift the Cassette Up Ass'y. While pulling the Cassette Up Ass'y out far enough so that it clears the Drive Rack Arm, slide the Drive Rack Unit as indicated by the arrow to remove the cassette tape from the Cassette Up Ass'y.**
7. **Check the cause of mechanical trouble and repair.**

Fig. 7-3



Method -2:

1. **Rotate Loading Motor counterclockwise with needlenose pliers, etc. so that the Pinch Roller is separated from the shaft of the Capstan Rotor Unit.**
2. **Perform Step 2 through Step 7 of Method -1.**

Method -3:

1. Perform Step 2 through Step 7 of Method -1.

Note:

After repairing mechanical trouble, make sure that all gear alignments are correct, especially the Wiper Arm Unit and Drive Rack Unit of Cassette Up Ass'y. (Refer to "EJECT Position Confirmation"in DISASSEMBLY/ASSEMBLY PROCEDURES.)

4.1.10.2. Electrical Method

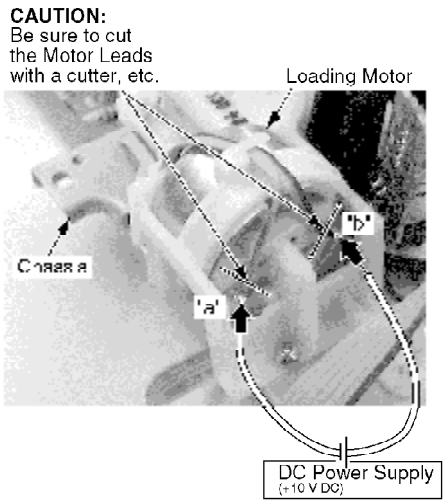
Electrical method can only be performed when the mechanism is moved by rotating the Loading Gear.

CAUTION:

1. **Before applying DC Power Supply, be sure to cut the Motor Leads with a cutter, etc.**
   Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.
2. **If loading does not start in approx. 2 seconds after DC Power Supply is applied, DO NOT continue to apply DC Power Supply. Instead, perform "Manual Method."**

1. **Be sure to cut the Motor Leads with a cutter, etc.**
2. **Apply +10.0 V DC Power Supply to the Loading Motor terminals.**
3. **When the Loading Posts reach the fully unloaded position, remove the Power Supply.**

Fig. 8



4. **Rewind the tape into the cassette by turning the Center Clutch Unit counterclockwise.**
5. **Eject the cassette by applying +10.0 V DC Power Supply again.**

4.1.11. BLACK SCREWS ON THE CHASSIS

Black Screws are used on the Mechanism Chassis to identify screws that require adjustment.

4.1.12. HOW TO RESET ALL VCR MEMORY FUNCTIONS

To reset (clear) the select language, channel auto set and set clock functions to their initial power on condition (power on, no cassette inserted), hold down the PLAY and CH UP buttons on the unit together for more than 5 seconds.
Power will shut off.

4.1.13. HOW TO CONFIRM AUTO CLOCK SET FEATURE

1. **Connect an RF cable from the output of one unit to the input of the test unit.**
2. **Select corresponding RF channels.**
3. **Playback a recording of P.B.S. channel including clock set data and confirm this feature.**

4.1.14. VARIABLE VOLTAGE ISOLATION TRANSFORMER

An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injuryfrom electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing. Also, when troubleshooting the above type of Power Supply Circuit, a variable isolation transformer is required in order to increase the input voltage slowly.

4.1.15. SPECIAL NOTE

All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.

4.1.16. MODEL NO. IDENTIFICATION MARK

Use Marks shown in the chart below to distinguish the different models included in this Service Manual.

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not Used	PT

Note:
Refer to Item 3 of Schematic Diagram Notes of Schematic Diagram Notes, for mark "PT."

5. DISASSEMBLY/ASSEMBLY PROCEDURES

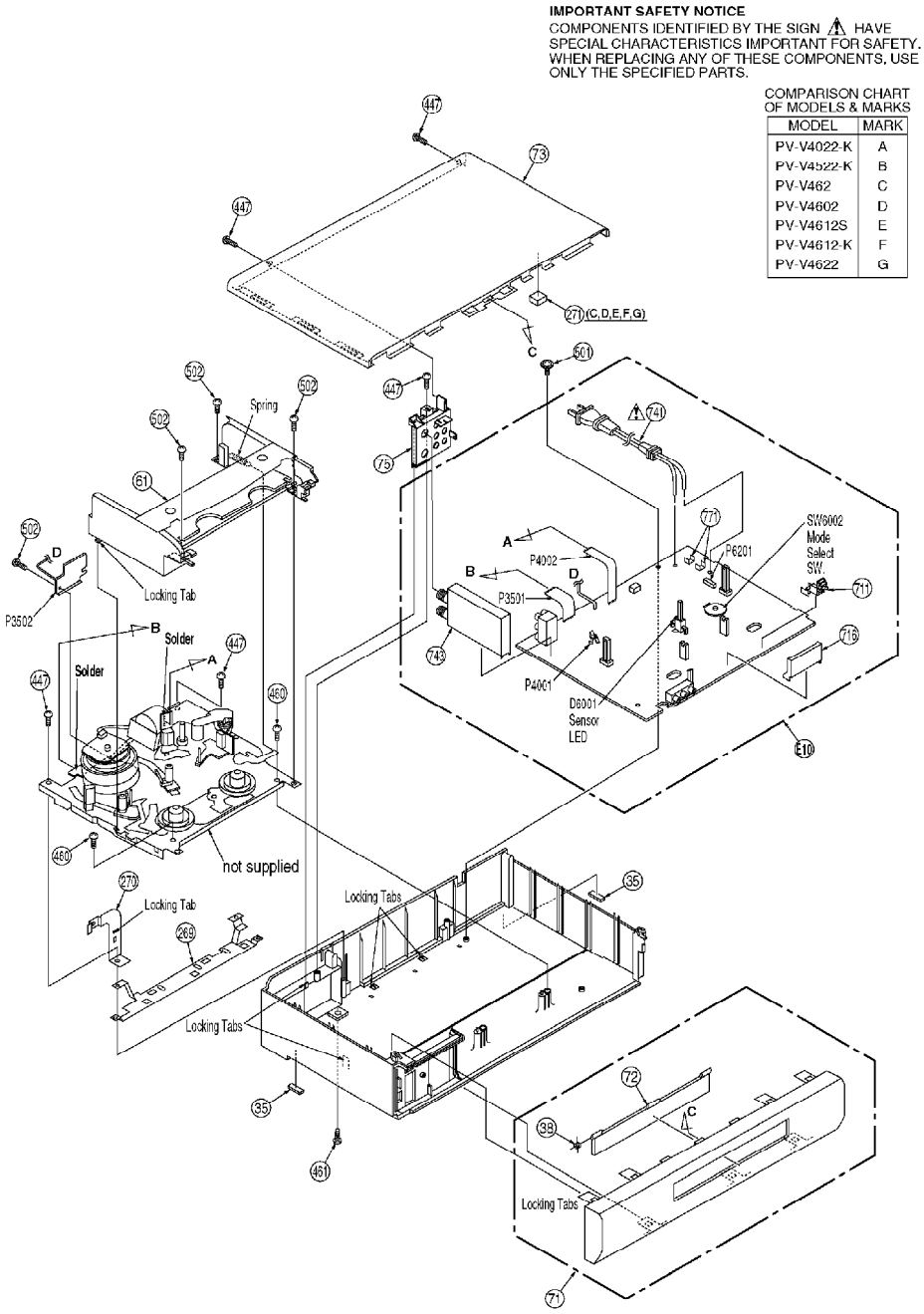
5.1. CABINET SECTION

5.1.1. Disassembly Method

STEP No.	Ref. No.	PART	REMOVE	NOTE
1	(73)	Top Cover	Screws (447) 2pcs	1
2	(71)	Front Panel Ass'y	Locking Tabs of Front Panel	2
3	-	Main C.B.A. & Mechanism Chassis	Screws (461), (447) 3pcs, (501), (460) 2pcs, Locking Tabs, Grounding Plates (269), (270) *Operation C.B.A. (Screw (447), Locking Tab)	3
4	(E10)	Main C.B.A.	Screw (502), Shield Plate Unit (P3502), Mechanism Chassis (P4001, P6201), Unsolder Flat Cables on Cylinder and AC Head	4,5
	-	Mechanism Chassis		
5	(61)	Cassette Up Ass'y	Screws (502) 3pcs, Locking Tab, Spring	6

*Note:
Please refer to Exploded View and Parts List for applicable model.
Also, some models in the Service Manual may not use the part.

Figure



5.1.1.1. Notes in chart

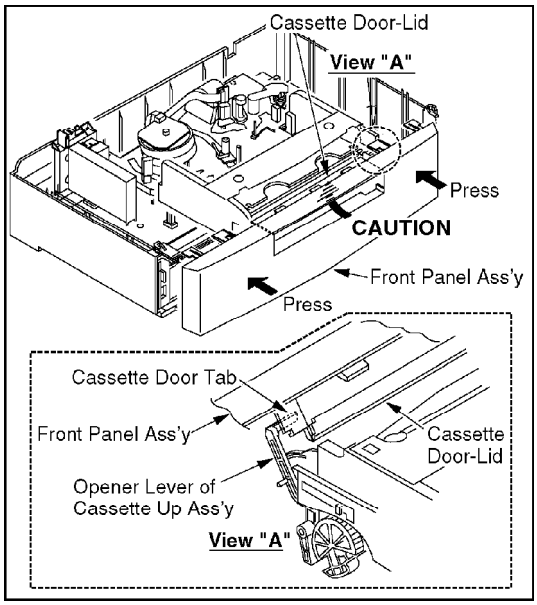
1. **Installation of Top Cover**
   Install the Top Cover front portion at a downward angle so that the tab on the Front Panel Ass'y fits into the hole in the Top Cover. Then, lower the rear portion into place and tighten 2 Screws (447).
2. **Installation of Front Panel Ass'y**
   CAUTION:

Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.

A. When installing the Front Panel Ass'y, swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.

B. Make sure that all locking tabs are aligned properly. Then, press the Front Panel straight in.

Fig. D1

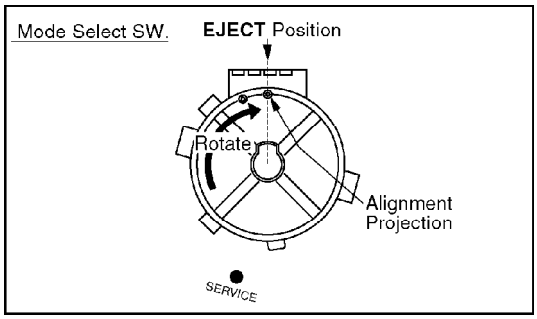


3. Installation of Main C.B.A. & Mechanism Chassis onto the Frame
When installing 2 Screws (460), slide the Holder Unit of the Cassette Up Ass'y (Refer to "WHEN LOADING WITHOUT A CASSETTE" in Service Notes) to tighten screws. Then, slide it back to the EJECT Position.

4. Installation of Mechanism Chassis and Cassette Up Ass'y onto Main C.B.A.

A. Make sure the Mode Select SW. on the Main C.B.A. is in EJECT position. If not, rotate the Mode Select SW. until the alignment projection is in the EJECT Position.

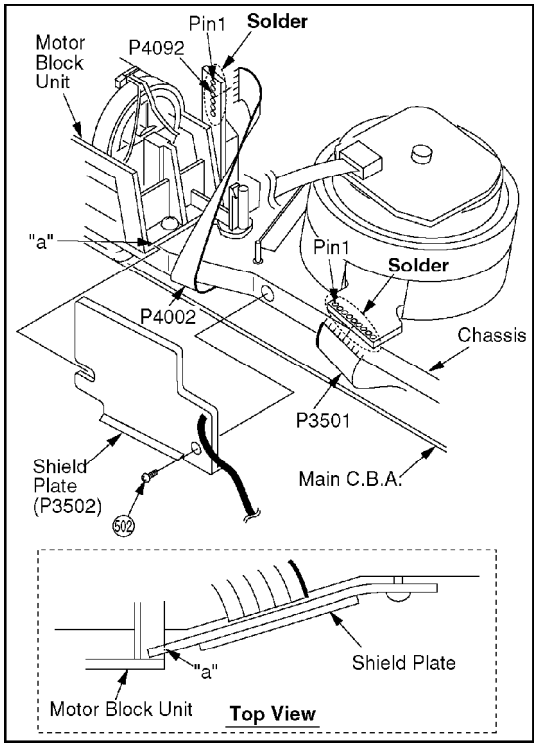
Fig. D2



B. Install the Mechanism Chassis and Cassette Up Ass'y straight onto the Main C.B.A. so that the Sensor LED clears the hole in the Mechanism Chassis and that 2 Connectors (P4001, P6201) are aligned and seated securely.

5. Flat Cable solder points on the Cylinder and AC Head
Solder the Flat Cables. Then, install the Shield Plate as shown.

Fig. D3



6. Installation of Cassette Up Ass'y

A. Confirm that the Locking Tab under the Cassette Up Ass'y is in Hole on the Mechanism Chassis when installing the Cassette Up Ass'y. Then, slide the Cassette Up Ass'y towards the back.

B. When installing 2 Screws (502), slide the Holder Unit (Refer to "WHEN LOADING WITHOUT A CASSETTE" in Service Notes) to tighten screws. Then, slide it back to the EJECT Position.

C. Hook Spring to the Drive Rack Arm on the Mechanism Chassis.

5.2. MECHANISM SECTION

5.2.1. Disassembly/Reassembly Method

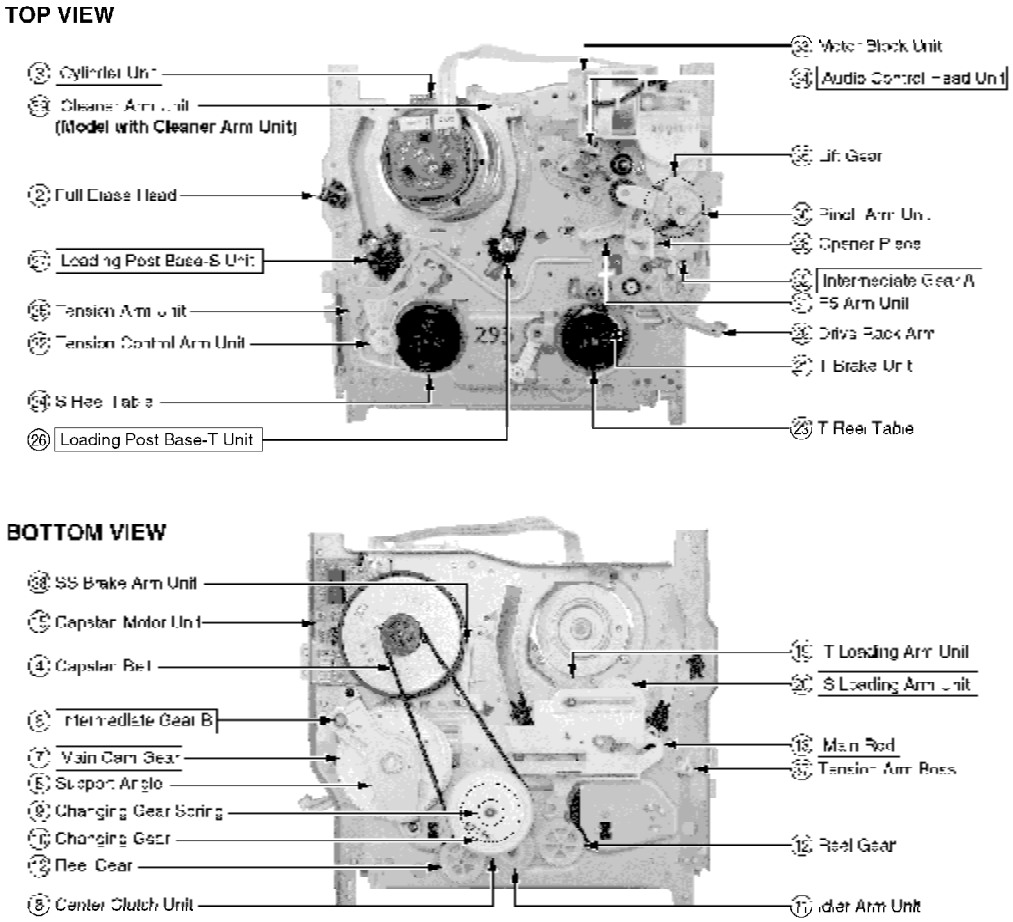
This procedure starts with the condition that the cabinet parts and Main C.B.A. have been removed.
When reassembling, perform the step(s) in the reverse order.
Perform all disassembly/reassembly and alignments procedures in EJECT Position.

Step/Loc No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	----------	Not used	-	-	
②	----------	Full Erase Head	J2	(L-1)	
③	1	Cylinder Unit	J2	3(S-3), Flexible Cable	TAPE INTERCHANGEABILITY Adjustment
④	----------	Capstan Belt	J3-1	-	
⑤	----------	Support Angle	J3-1	(S-4), (S-5)	
⑥	5	Intermediate Gear B	J3-1	(L-2)	Gear Alignment
⑦	4,5,6	Main Cam Gear	J3-1	Main Cam Push Nut	Gear Alignment
⑧	4	Center Clutch Unit	J4-1	(W-1)	
⑨	4,8	Changing Gear Spring	J4-1	-	
⑩	4,8,9	Changing Gear	J4-1	-	
⑪	4,8,9,10	Idler Arm Unit	J4-1	-	
⑫	----------	Reel Gear	J5-1	2(L-3)	
⑬	4,5,6,7,8,9,10	Main Rod	J5-1	(W-2), (L-4)	Gear Alignment
⑭	----------	Not used	-	-	
⑮	4	Capstan Motor Unit	J6	3(S-6), Unsolder	
⑯	----------	Not used	-	-	
⑰	----------	Not used	-	-	
⑱	----------	Not used	-	-	
⑲	4,8,9,10,18	T Loading Arm Unit	J7-1	-	Gear Alignment
⑳	4,5,6,7,8,9,10,13,19	S Loading Arm Unit	J7-1	-	Gear Alignment
㉑	----------	T Brake Unit	J8-1	-	
㉒	----------	Tension Control Arm Unit	J8-1	3(L-5)	
㉓	21	T Reel Table	J8-1	-	
㉔	22	S Reel Table	J8-1	-	
㉕	22	Tension Arm Unit	J8-1	2(L-6), (P-1), (P-2)	
㉖	22,25	Loading Post Base-T Unit	J9	-	P2 AND P3 POST HEIGHT, TAPE INTERCHANGEABILITY Adjustment
㉗	22,25	Loading Post Base-S Unit	J9	-	
㉘	----------	Opener Piece	J10-1	2(L-7)	
㉙	4,5,6,7	Drive Rack Arm	J10-1	-	
㉚	28	Pinch Arm Unit	J10-1	-	
㉛	28,30	P5 Arm Unit	J10-1	(W-3)	
㉜	5,6,28	Intermediate Gear A	J10-1	-	Gear Alignment
㉝	----------	Motor Block Unit	J11	2(S-9)	
㉞	----------	Audio Control Head Unit	J11	(S-10)	TAPE INTERCHANGEABILITY Adjustment
㉟	5,6,28,30,32,33	Lift Gear	J11	-	
㊱	----------	Not used	-	-	
㊲	22,25	Tension Arm Boss	J11	(L-8)	
㊳	----------	SS Brake Arm Unit	J5-1	(L-9), (P-3)	
㊴	----------	Cleaner Arm Unit **(Model with Cleaner Arm Unit)**	J11	(L-10)	

5.2.2. Inner Parts Location

Note: BOX indicates alignment (Gear Alignment or Mechanical Adjustment) required when a part is replaced.

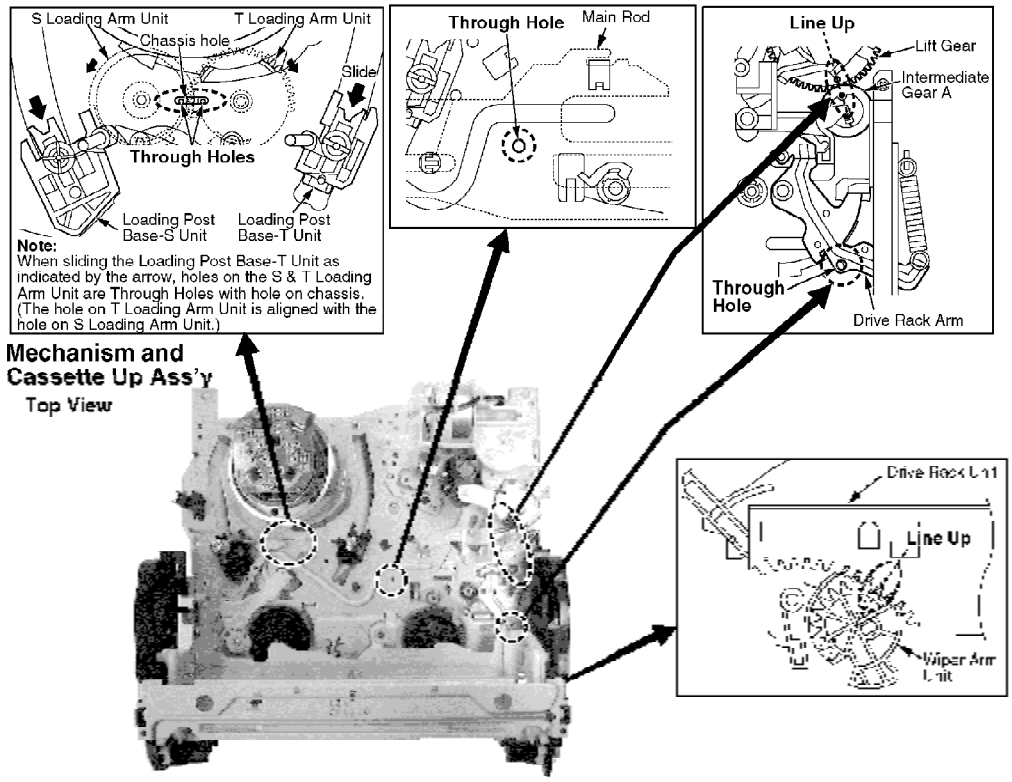
Fig. J1-1



5.2.3. EJECT Position Confirmation

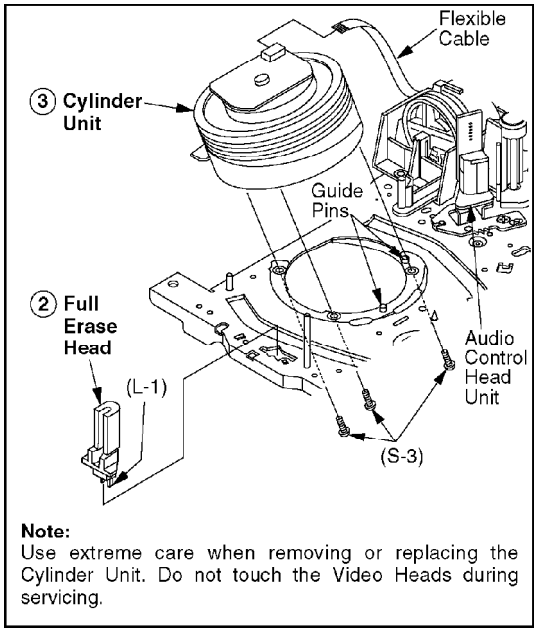
Fig. J1-2

Check the following alignment points to confirm that the Mechanism and Cassette Up Ass'y are in the **EJECT** Position from the top side.


S Loading Arm Unit
T Loading Arm Unit
Chassis hole
Slide
Through Holes
Loading Post Base-S Unit
Loading Post Base-T Unit
Note:
When sliding the Loading Post Base-T Unit as indicated by the arrow, holes on the S & T Loading Arm Unit are Through Holes with hole on chassis. (The hole on T Loading Arm Unit is aligned with the hole on S Loading Arm Unit.)
Through Hole
Main Rod
Line Up
Lift Gear
Intermediate Gear A
Through Hole
Drive Rack Arm
Mechanism and Cassette Up Ass'y
Top View
Drive Rack Unit
Line Up
Wiper Arm Unit

5.2.4. Full Erase Head and Cylinder Unit

Fig. J2


Flexible Cable
3 Cylinder Unit
Guide Pins
2 Full Erase Head
(L-1)
Audio Control Head Unit
(S-3)
Note:
Use extreme care when removing or replacing the Cylinder Unit. Do not touch the Video Heads during servicing.

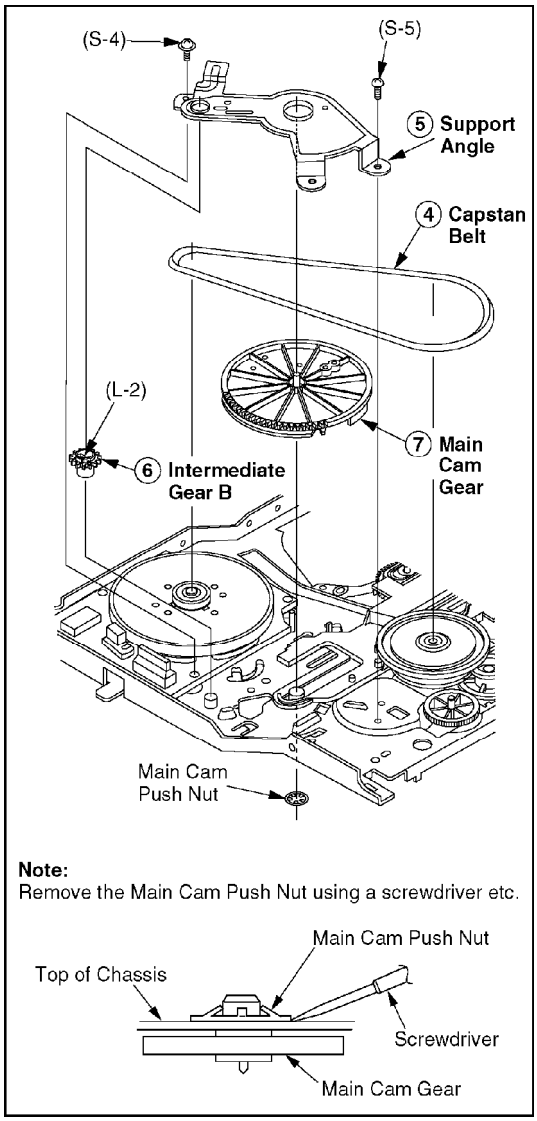
5.2.4.1. Reassembly Notes

1. After replacing the Cylinder Unit, clear the Total elapsed "Cylinder rotation" time (in hours) to 0. Refer to "USAGE SCREEN MODE" in

SERVICE NOTES.

5.2.5. Capstan Belt, Support Angle, Intermediate Gear B, and Main Cam Gear

Fig. J3-1



5.2.5.1. Reassembly Notes

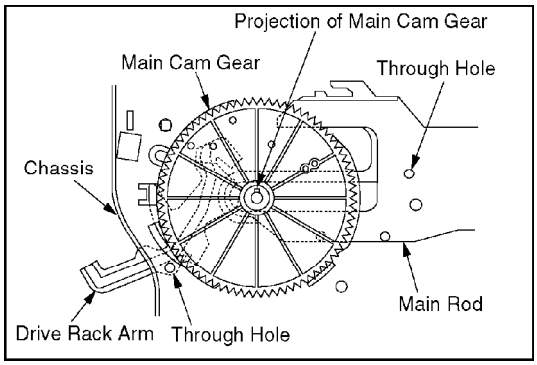
1. Alignment of Main Cam Gear, Drive Rack Arm, and Main Rod

A. Confirm that the hole on Main Rod is a Through Hole with a hole on chassis.

B. Confirm that the hole on Drive Rack Arm is a Through Hole with a hole on chassis.

C. Install the Main Cam Gear so that the projection of Main Cam Gear is in the upward position as shown.

Fig. J3-2

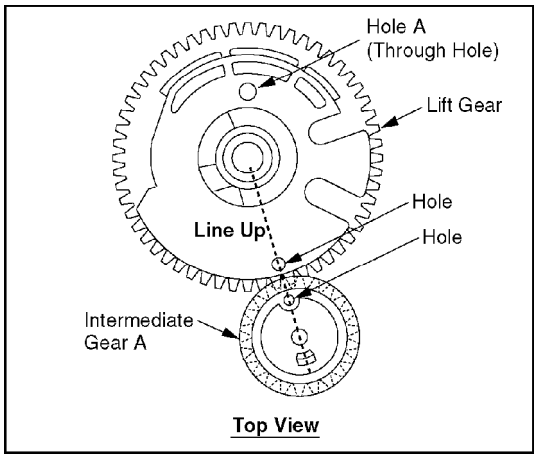


2. Confirmation/Alignment of Intermediate Gear B, Main Cam Gear, and Intermediate Gear A

A. Confirm that the Hole A on Lift Gear is a Through Hole with a hole on chassis.

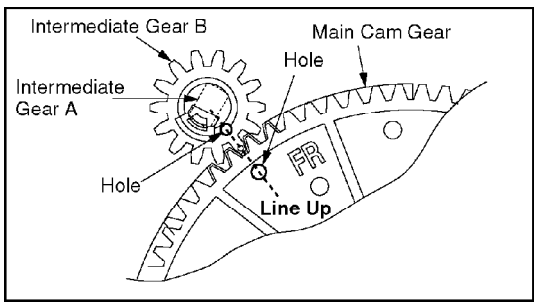
B. Confirm that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.

Fig. J3-3



C. Install the Intermediate Gear B so that the hole on the Intermediate Gear B is aligned with the hole on the Main Cam Gear.

Fig. J3-4

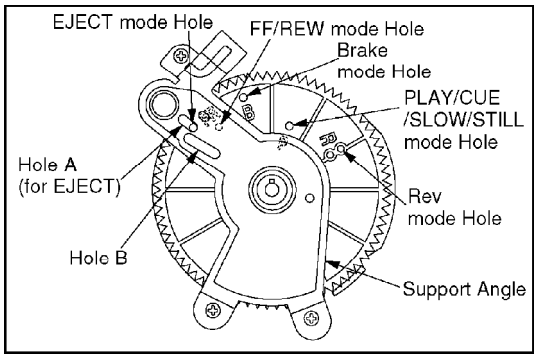


3. Holes on Main Cam Gear

A. The EJECT mode Hole on Main Cam Gear should be a Through

Hole with Hole A on Support Angle in EJECT mode. The each mode Hole on Main Cam Gear should be a Through Hole with Hole B on Support Angle in each mode.

Fig. J3-5



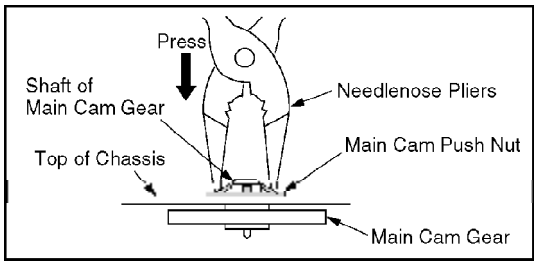
4. Main Cam Gear Kit

A. Main Cam Gear is supplied as a Main Cam Gear Kit only (Kit No. VVGS0009).
Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut.
However, Main Cam Push Nut is available separately as a replacement part.

5. Installation of Main Cam Gear and Main Cam Push Nut

A. After installing the Support Angle, install the Main Cam Push Nut with Needlenose Pliers etc. so that it is flush with the chassis.
There may be some slight scratches on the Shaft of Main Cam Gear, when removing the Main Cam Gear. In case that the Main Cam Gear can be installed securely without tottering, it is fine to use the one. If any tottering, install all new parts.

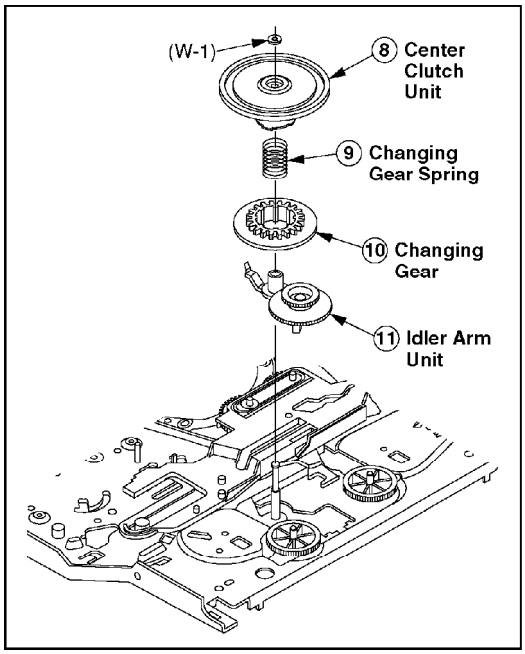
Fig. J3-6



6. The Main Cam Push Nut is not reusable. Install a new one.

5.2.6. Center Clutch Unit, Changing Gear Spring, Changing Gear, and Idler Arm Unit

Fig. J4-1

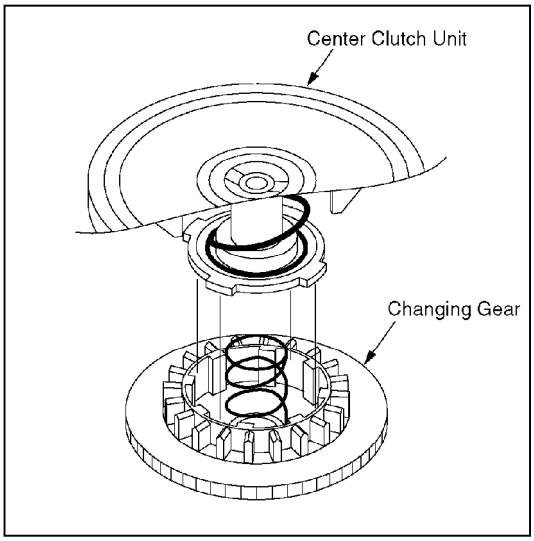


5.2.6.1. Reassembly Notes

1. Installation of Center Clutch Unit

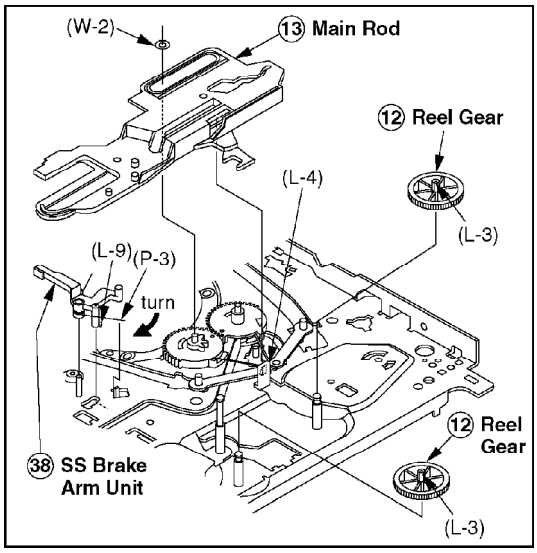
A. Fit the Center Clutch Unit into the Changing Gear.

Fig. J4-2



5.2.7. Reel Gear, Main Rod, and SS Brake Arm Unit

Fig. J5-1

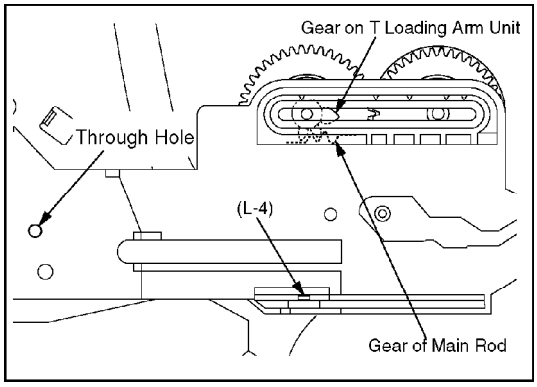


5.2.7.1. Reassembly Notes

1. Alignment of Main Rod and T Loading Arm Unit

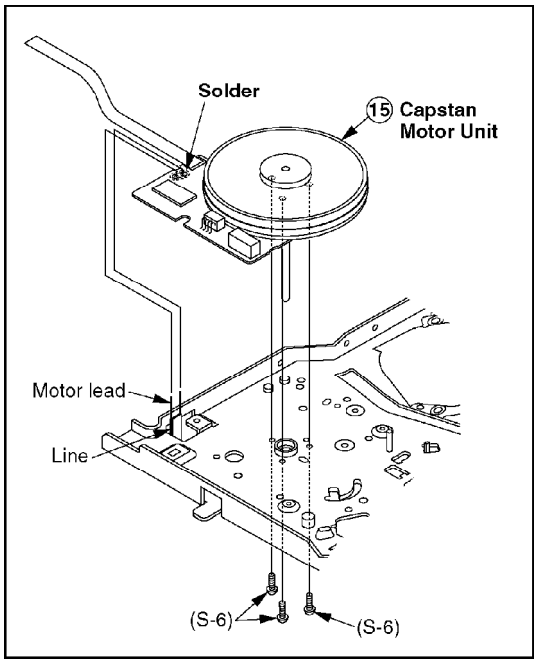
A. Align the Gear on T Loading Arm Unit with Gear of Main Rod. Confirm that the Hole on Main Rod is a Through Hole with a hole on chassis.

Fig. J5-2



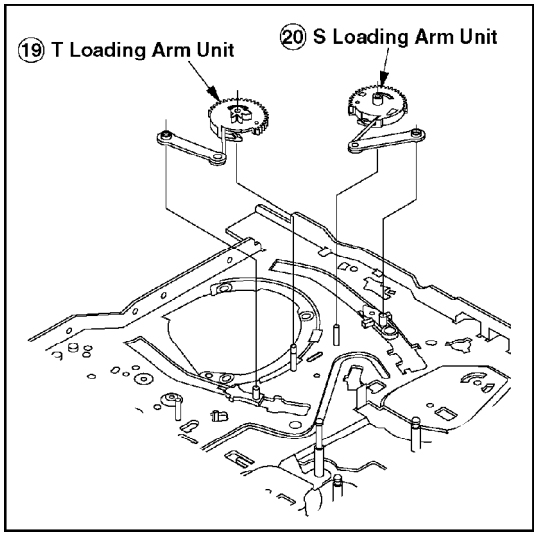
5.2.8. Capstan Motor Unit

Fig. J6



5.2.9. T Loading Arm Unit and S Loading Arm Unit

Fig. J7-1



5.2.9.1. Reassembly Notes

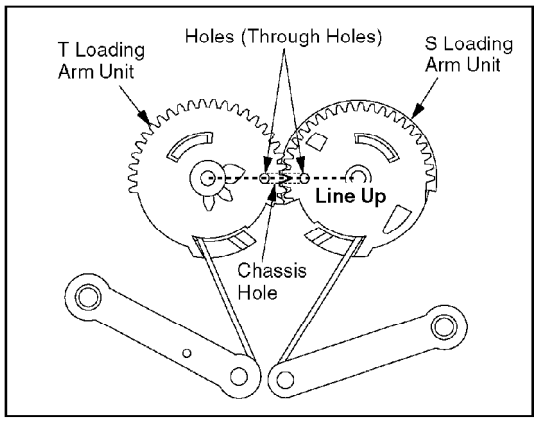
1. Alignment of T Loading Arm Unit and S Loading Arm Unit

A. Install the S Loading Arm Unit onto the chassis.

B. Install the T Loading Arm Unit so that the hole on T Loading Arm Unit is aligned with the hole on S Loading Arm Unit.

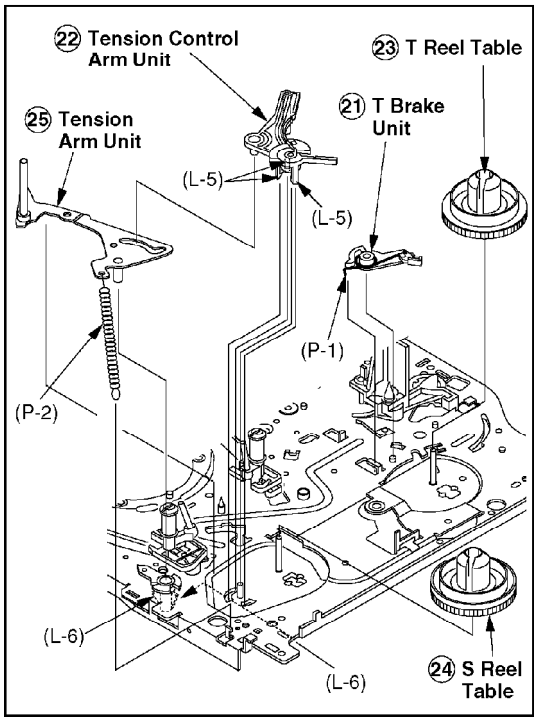
C. Confirm that the holes on the S & T Loading Arm Unit are Through Holes with hole on chassis.

Fig. J7-2



5.2.10. T Brake Unit, Tension Control Arm Unit, T Reel Table, S Reel Table, and Tension Arm Unit

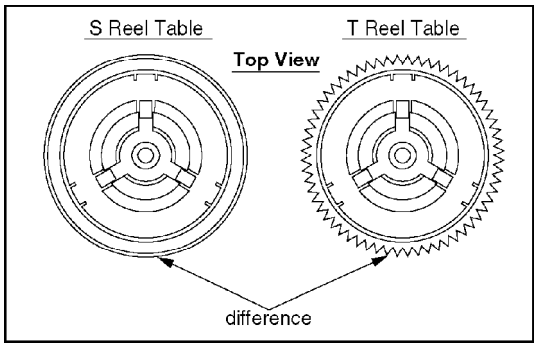
Fig. J8-1



5.2.10.1. Reassembly Notes

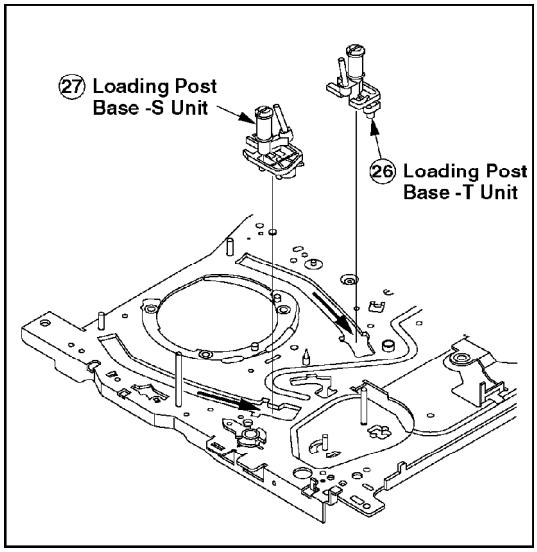
1. How to distinguish between S Reel Table and T Reel Table

Fig. J8-2



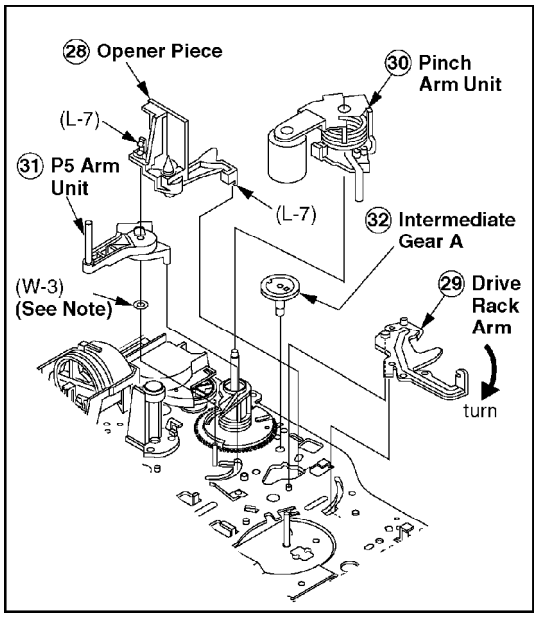
5.2.11. Loading Post Base -T Unit and Loading Post Base -S Unit

Fig. J9



5.2.12. Opener Piece, Drive Rack Arm, Pinch Arm Unit, P5 Arm Unit, and Intermediate Gear A

Fig. J10-1



Note:

In early units, a washer is used. When servicing the washer or the P5 Arm Unit, replace only the P5 Arm Unit with a new one, and remove the washer.

5.2.12.1. Reassembly Notes

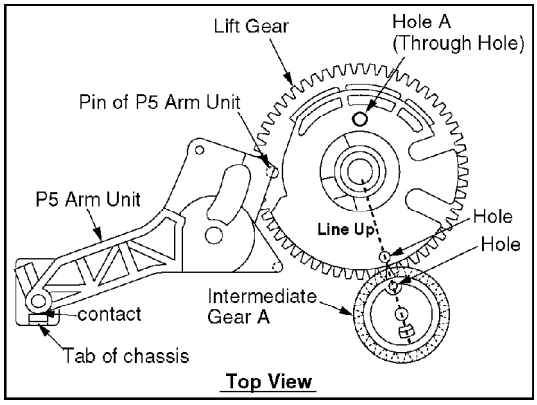
1. Installation/Alignment of Intermediate Gear A, Lift Gear and P5 Arm Unit

A. Rotate the Lift Gear so that Hole A on Lift Gear is a Through Hole with a hole on chassis.

B. Install the Intermediate Gear A so that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.

C. Install the P5 Arm Unit so that it contacts with the tab of chassis.

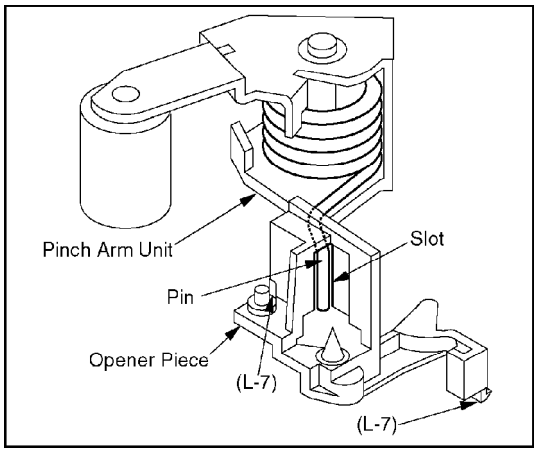
Fig. J10-2



2. Installation of Opener Piece

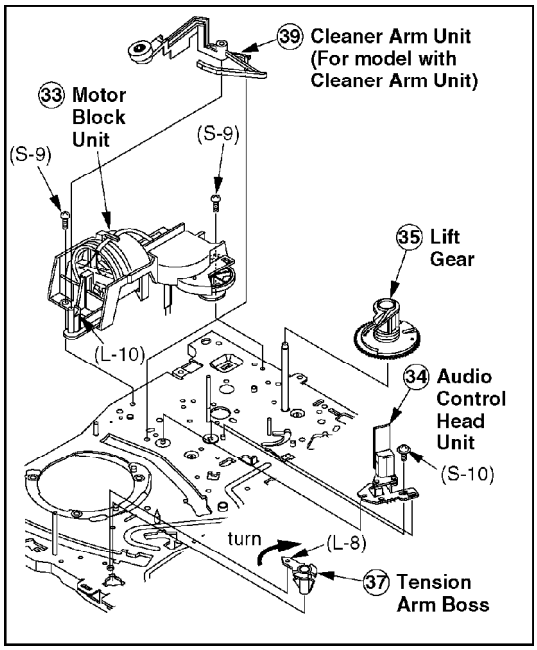
A. Install the Opener Piece so that the slot of the Opener Piece is inserted to the Pin of Pinch Arm Unit

Fig. J10-3



5.2.13. Motor Block Unit, Audio Control Head Unit, Lift Gear, Tension Arm Boss, and Cleaner Arm Unit

Fig. J11



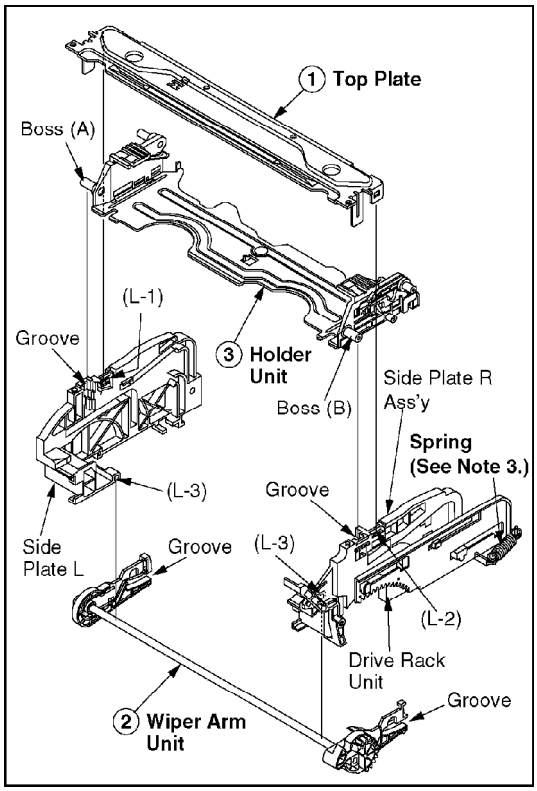
5.3. CASSETTE UP ASSEMBLY SECTION

This chart indicates Step/Location No. of Parts to be serviced and prior steps to gain access items to be serviced when disassembling. When reassembling, perform the step(s) in the reverse order.

Step/Loc No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	----------	Top Plate	K1-1	(L-1), (L-2)	
②	1	Wiper Arm Unit	K1-1	2(L-3)	Gear Alignment
③	1,2	Holder Unit	K1-1	-	
④	----------	Opener Lever	K2	2(L-4)	
⑤	1,2,3,4	Drive Rack Unit	K2	-	

5.3.1. Top Plate, Wiper Arm Unit, and Holder Unit

Fig. K1-1



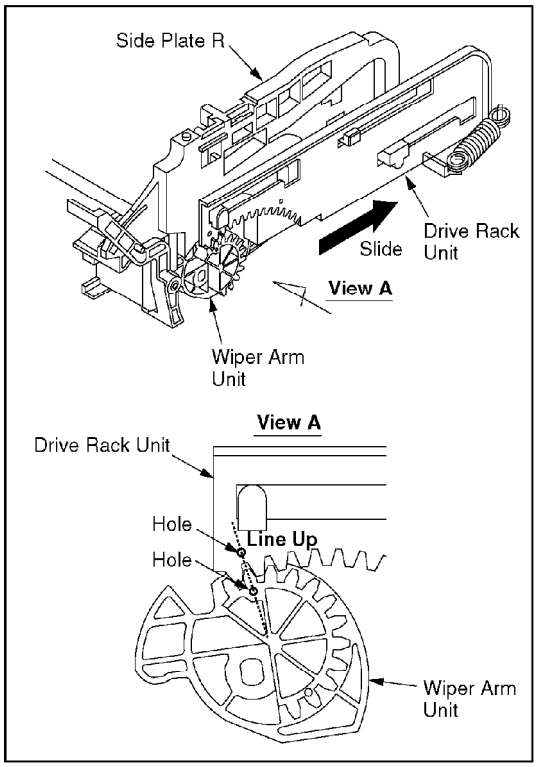
5.3.1.1. Reassembly Notes

1. Alignment of Wiper Arm Unit and Drive Rack Unit

A. Slide the Drive Rack Unit to the far right as indicated by the arrow.

B. Install the Wiper Arm Unit so that the hole on the Wiper Arm Unit is aligned with the hole on the Drive Rack Unit.

Fig. K1-2



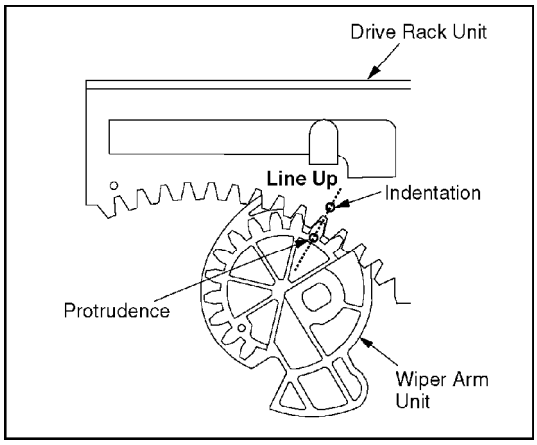
2. Installation of Holder Unit

A. Turn the Wiper Arm Unit so that the grooves on each end are aligned with the each groove on Side Plate L and R.

B. Insert Holder Unit boss (A) and (B) into the grooves as shown in Fig. K1-1.

C. Finally, in the EJECT Position, confirm that the protrudence on the Wiper Arm Unit is aligned with the indentation on the Drive Rack Unit.

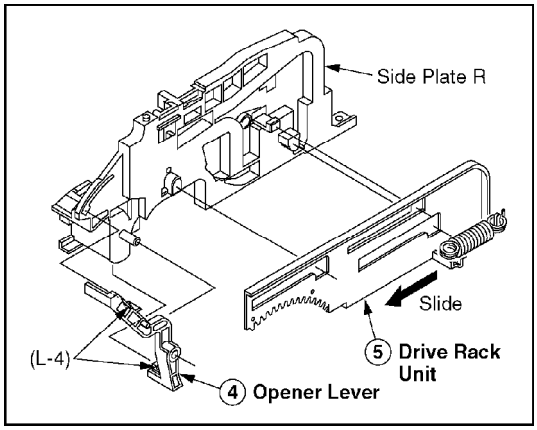
Fig. K1-3



3. Make sure to hook the spring to the Drive Rack Arm of Mechanism chassis.

5.3.2. Opener Lever and Drive Rack Unit

Fig. K2



6. ADJUSTMENT PROCEDURES

6.1. SERVICE FIXTURES AND TOOLS

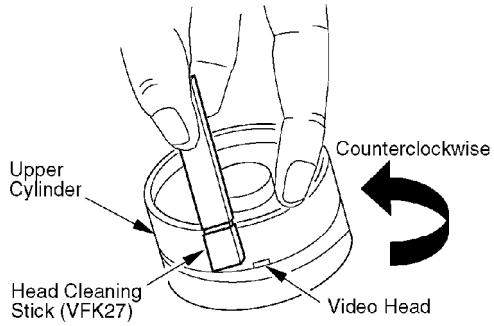
VFMS0003H6 VHS Alignment Tape Video: Color Bar & Monoscope Audio: 6kHz(MONO)	Back Tension Meter (Made in USA., Purchase Locally)	VFK27 Head Cleaning Stick
VFK0330 H-Position Adjustment Driver	VFKS0081 Grease	VFK0329 Post Adjustment Driver

6.2. MECHANICAL ADJUSTMENT

6.2.1. CLEANING PROCEDURE FOR THE UPPER CYLINDER UNIT

1. While slowly turning the Upper Cylinder Unit counterclockwise by hand, gently rub the Video Heads with a Head Cleaning Stick (VFK27) moistened with Ethanol.
When using a Cleaning Cassette, make sure to use "DRY" type only and be aware that excessive use can shorten head life.

Fig. M1



Note:

1. **Do not rub vertically or apply excess pressure to the Video Heads. Do not turn the Upper Cylinder Unit clockwise while cleaning.**
2. **After cleaning, use a Dry Head Cleaning Stick (VFK27) to remove any Ethanol remaining on the cylinder tape path. Otherwise, tape damage will occur.**

6.2.2. ADJUSTMENT PROCEDURES

6.2.2.1. BACK TENSION CONFIRMATION

Purpose:

To fine adjust the Back Tension so that the tape runs smoothly with a constant tension.

Symptom of Misadjustment:

1) If the tape tension is less than the specified value, the tape cannot come into proper contact with the Video Heads, resulting in poor picture playback.

2) If the tape tension is too high, the tape will soon be damaged.

Equipment Required:

Back Tension Meter (Made in U.S.A., Purchase Locally)

VHS Cassette Tape (120-Minute Tape)

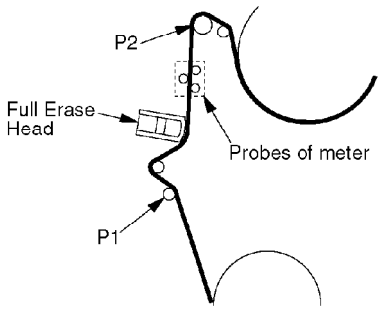
Specification:

22.4 gf±2.5 gf

(0.220 N±0.025 N)

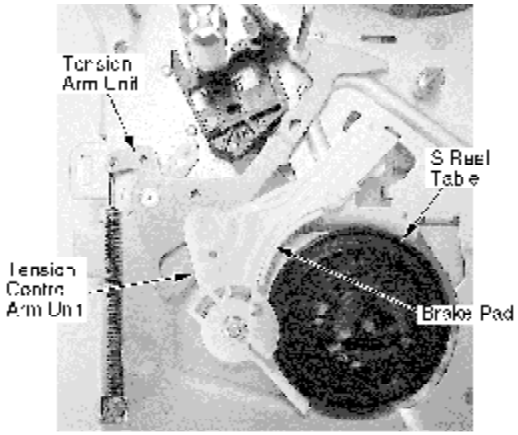
1. **Play back a T120 cassette tape from the beginning for approx. 10 to 20 seconds to stabilize tape movement.**
2. **Insert a Tension Meter into tape path and measure the back tension.**

Fig. M2-1



3. If the reading is out of specification, make sure that there is no dust or foreign material between the Brake Pad of Tension Control Arm Unit and the S Reel Table.
   After cleaning, the reading of tension measurement is still out of specification, replace the Tension Arm Unit and the Tension Control Arm Unit.

Fig. M2-2



Note:

1. Be sure that the three probes of the meter are all in solid contact with the tape, but not touching any other parts of the mechanism.
2. It is recommended that measurements should be repeated at least three (3) times because the tension meter is very sensitive to external vibrations.

6.2.2.2. TAPE INTERCHANGEABILITY ADJUSTMENT

Note:

To perform these adjustment/confirmation procedures, enter the Tracking center mode.

Equipment Required:

Dual Trace Oscilloscope

VHS Alignment Tape (VFMS0003H6)
Post Adjustment Driver (VFK0329)
H-Position Adjustment Driver (VFK0330)

6.2.2.2.1. ENVELOPE OUTPUT ADJUSTMENT

The height of the P2 and P3 Posts replacement part is preadjust at the factory.

Purpose:

To achieve a satisfactory picture and secure precise tracking.

Symptom of Misadjustment:

If the envelope is output poorly, much noise will appear in the picture. Then the tracking will lose precision and the playback picture will be distorted by any slight variation of the tracking control circuit.

Equipment Required:

Post Adjustment Driver (VFK0329)

1. **Insert the alignment tape.**
2. **Press and hold FF button and CH DOWN buttons on VCR together over 5 seconds in power off condition.**
   The power comes on and the unit goes into service mode.
3. **Play back the alignment tape.**
4. **To enter Tracking center mode, press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.**
5. **Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.**
6. **Confirm that the RF envelope is flat enough (V1/V-max. is 0.7 or more). If not, with Post Adjustment Driver, adjust P2 and P3 post height so that the envelope waveform becomes as flat (V1/V-max. is 0.7 or more) as possible (Noenvelope drop). If the envelope drop appears on the left-half of the waveform, adjust P2 post height. If the envelope drop appears on the right-half of the waveform, adjust P3 post height.**

   CAUTION:

   Overtightening P2 and P3 posts may cause the threads to strip.

   Note:

   It will be possible to confirm Step 6 according to following steps.

1. **Release the Tracking center mode.**
2. **Press the Tracking Control Up or Down button on remote control. Make sure that the envelope waveform remains flat. If not, readjust P2 and/or P3 post heights.**

Fig. M3-1

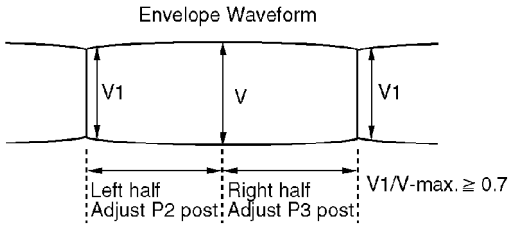
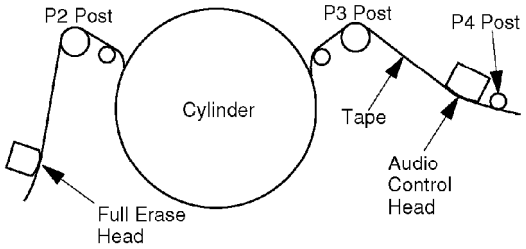
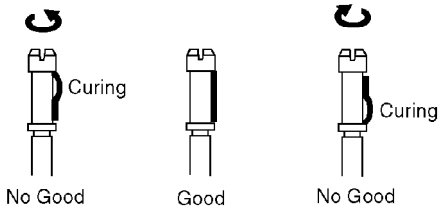


Fig. M3-2



7. **After adjustment, confirm that the tape travels without curling at P2 and P3 posts.**

Fig. M3-3



8. **To release from Tracking center mode, press PLAY or STOP button.**

6.2.2.2.2. AUDIO CONTROL HEAD TILT ADJUSTMENT

Purpose:

To confirm that the tape runs smoothly. In particular, confirm that the tape properly picks up the Audio Signal at the upper part of the head and the Control Signal at the lower part of the head.

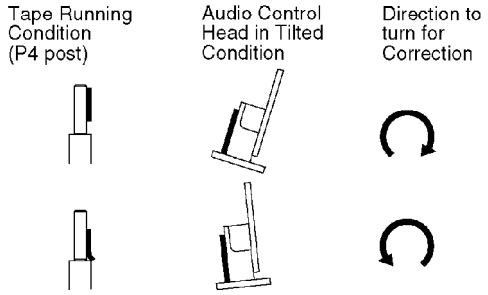
Symptom of Misadjustment:

If the tilt of the Audio Control Head is poorly adjusted, the tape

will eventually be damaged. An intermittent Blue screen may be seen in Playback.

1. **Play back a T120 cassette tape and check that the tape travels smoothly between the upper and lower guides of the P4 post.**
2. **If necessary, adjust Black Screw (B) clockwise until the tape begins to curl at the lower edge of the P4 post. Then adjust the screw counterclockwise until the curling is eliminated.**

Fig. M4



6.2.2.2.3. AUDIO CONTROL HEAD HEIGHT ADJUSTMENT

The height of the Audio Control Head replacement part is preset at the factory.

Purpose:

To be sure the tape runs properly along the Control Head.

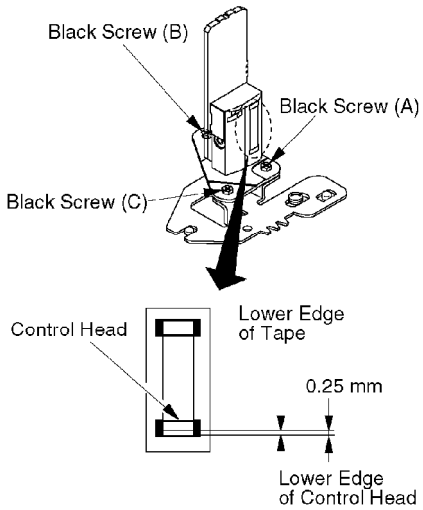
Symptom of Misadjustment:

If the control signal is not properly picked up, Servo Operation cannot be achieved. A Blue screen will be seen in Playback.

This confirmation is required when the Audio Control Head is replaced.

1. **Play back a T120 cassette tape and check that the lower edge of the tape runs approximately 0.25 mm above the lower edge of the Audio Control Head.**
2. **If necessary, adjust Black Screws (A) and (B) clockwise to lower the tape or counterclockwise to raise.**

Fig. M5



6.2.2.2.4. AUDIO CONTROL HEAD AZIMUTH ADJUSTMENT

Purpose:

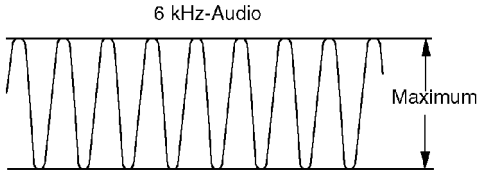
To adjust the position and height of the Audio Control Head so that it meets the tape tracks properly.

Symptom of Misadjustment:

If the position of the Audio Control Head is not properly adjusted, the Audio S/N Ratio is poor.

1. **Connect the oscilloscope to the audio output jack on the rear side of the deck.**
2. **Play back the 6 kHz Monaural Audio portion of the alignment tape.**
3. **Adjust Black Screw (C) on the Audio Control Head base so that the output level is at maximum.**

Fig. M6



4. **Confirm the height of the Audio Control Head is proper. If not, readjust Black Screws (A) and (B).**

6.2.2.2.5. AUDIO CONTROL HEAD HORIZONTAL POSITION ADJUSTMENT

Purpose:

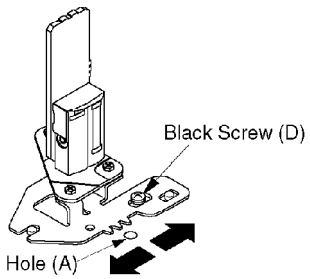
To adjust the Horizontal Position of the Audio Control Head.

Symptom of Misadjustment:

If the Horizontal Position of the Audio Control Head is not properly adjusted, a maximum envelope cannot be obtained at the Neutral Position of the Tracking Control Circuit.

1. **Insert the alignment tape.**
2. **Press and hold FF button and CH DOWN buttons on VCR together over 5 seconds in power off condition.**
   The power comes on and the unit goes into service mode.
3. **Play back the alignment tape.**
4. **To enter Tracking center mode, press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.**
5. **Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.**
6. **Loosen the Black Screw (D) and tighten it slightly. Set the H-Position Adjustment Driver into the Hole (A). Then slowly turn the fixture either clockwise or counterclockwise so that the envelope is at maximum.**

Fig. M7



7. **Tighten Black Screw (D).**
8. **To release from Tracking center mode, press PLAY or STOP button.**

Note:

Old type of H-Position Adjustment Driver (VFK0136) can be used for this adjustment.

6.3. ELECTRICAL ADJUSTMENT

6.3.1. EVR (Electronic Variable Resister) ADJUSTMENT WITH THE REMOTE CONTROL

This unit has electronic technology using I2C Bus concept.The PG SHIFTER ADJUSTMENT is

adjusted by using " On Screen Display " and the remote control instead of adjusting mechanical controls (VR).

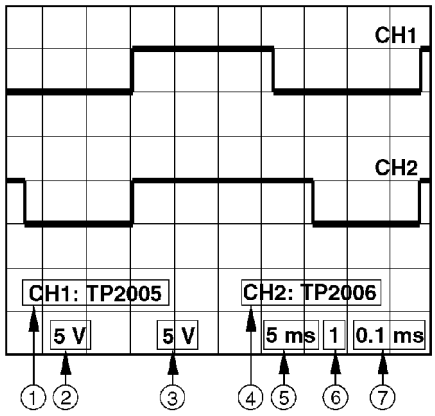
6.3.2. TEST EQUIPMENT

To do all of these electrical adjustments, the following equipment is required.

1. Dual-Trace Oscilloscope
   Voltage Range: 0.001 V to 50 V/Div.
   Frequency Range: DC to 50 MHz
   Probes: 10:1, 1:1
2. Isolation Transformer (Variable)
3. VHS Alignment Tape (VFMS0003H6)
4. TV monitor

6.3.3. HOW TO READ THE ADJUSTMENT PROCEDURES

Fig.E1



1. Connecting Point
3. Volts/DIV
5. Time/DIV
7. Time/DIV for Delay

2. Volts/DIV
4. Connecting Point
6. Trigger Channel of the Scope
   1 : CH1
   2 : CH2

6.3.4. PG SHIFTER ADJUSTMENT

Purpose:

Determine the Video Head Switching Point during Playback.

Symptom of Misadjustment:

May cause Head Switching Noise and/or Vertical Jitter.

Test Point :

TP3001 (Main C.B.A.),
TP6205 (Main C.B.A.)

Specification:

T = 6 H±0.5 H (0.38 ms±0.03 ms)

Mode :

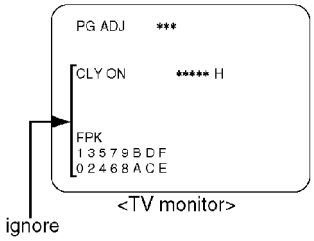
SP Playback

Equipment :

Oscilloscope,
VHS Alignment Tape (VFMS0003H6),
TV monitor

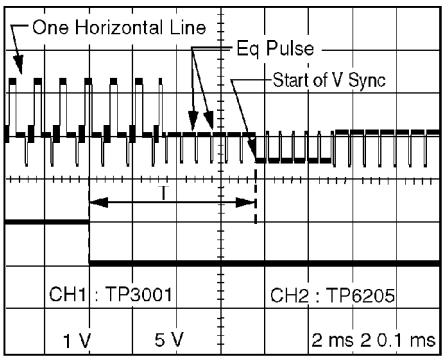
1. **Insert the VHS Alignment Tape. Then turn off the power. Enter service mode by pressing and holding FF and CH DOWN buttons on VCR together for more than 5 seconds in power off condition. The power comes on.**
2. **Playback in SP mode. Then, press 100 button on the remote to enter EVR PG SHIFTER ADJUSTMENT mode. PG ADJUSTMENT screen will appear on the TV Monitor.**

Fig. E2-1



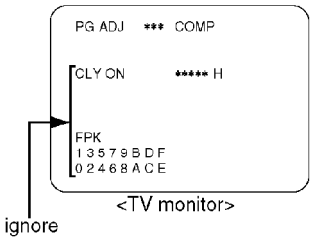
3. **Connect the channel-1 scope probe to TP3001 and the channel-2 scope probe to TP6205. Used TP6205 as a trigger**
4. **Adjust value so that the trailing edge of the head switching pulse is placed 6 H±0.5 H (0.38 ms±0.03 ms) before the start of the vertical sync pulse by pressing CH UP and CH DOWN buttons on the remote control.**

Fig. E2-2



5. After adjustment is completed, press REC button on the remote control. Then " COMP " will appear on the TV monitor and adjusted value will be written to Memory IC (IC6005).

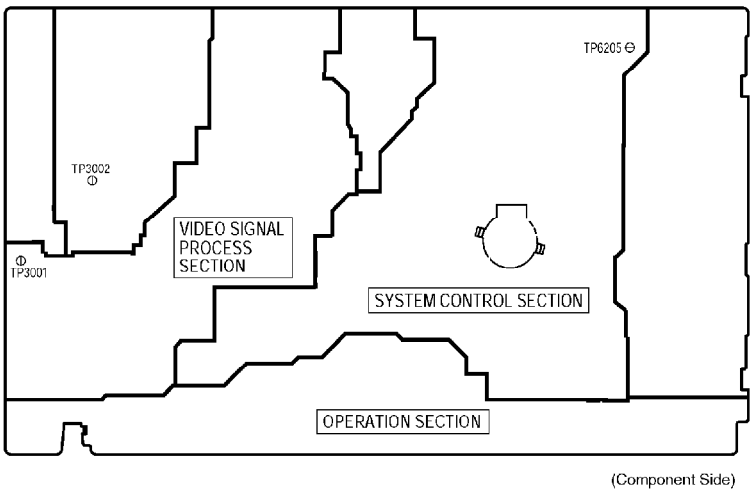
Fig.E2-3



6. Press STOP button on the remote control to release from EVR PG SHIFTER ADJUSTMENT MODE.

6.4. TEST POINTS AND CONTROL LOCATION

Main C.B.A.



(Component Side)

FUNCTION OF IMPORTANT TEST POINTS	
TP3001	Video Signal to Jack
TP3002	REC/PB Video envelope signal
TP6205	Head SW.

Test Point Information

ⓘ Test Point with a jumper wire across a hole in the P.C.B.

7. SCHEMATIC DIAGRAMS

7.1. SCHEMATIC DIAGRAM& CIRCUIT BOARD LAYOUT NOTES

7.2. MAIN SCHEMATIC DIAGRAMS

7.3. INTERCONNECTION SCHEMATIC DIAGRAM

7.4. SIGNAL WAVEFORMS

8. CIRCUIT BOARD LAYOUT

8.1. MAIN C.B.A.

9. BLOCK DIAGRAMS

9.1. OVERALL BLOCK DIAGRAM (Model: PV-V4022-K)

9.2. OVERALL BLOCK DIAGRAM (Models: PV-V4522-K, PV-V462, PV-V4602 , PV-V4612S, PV-V4612-K, PV-V4622)

10. EXPLODED VIEWS

10.1. MECHANISM (TOP) SECTION

MAIN C.B.A. LSEP2006GA (A) / LSEP2006HA (B) / LSEP2006HH (C) / LSEP2006HF (D) / LSEP2006HC (E,F) / LSEP2006HD (G)

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE 1.6A 125/250V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES
D'T INCENDIE N'I UTILISERQUE DES FUSIBLE DE MÉME
TYPE 1.6A 125/250V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,
USE ONLY THE SPECIFIED PARTS.

NOTE:
CIRCUIT BOARD LAYOUT SHOWS COMPONENTS INSTALLED FOR VARIOUS MODELS.
FOR PROPER PARTS CONTENT FOR THE MODEL YOU ARE SERVICING,
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST.

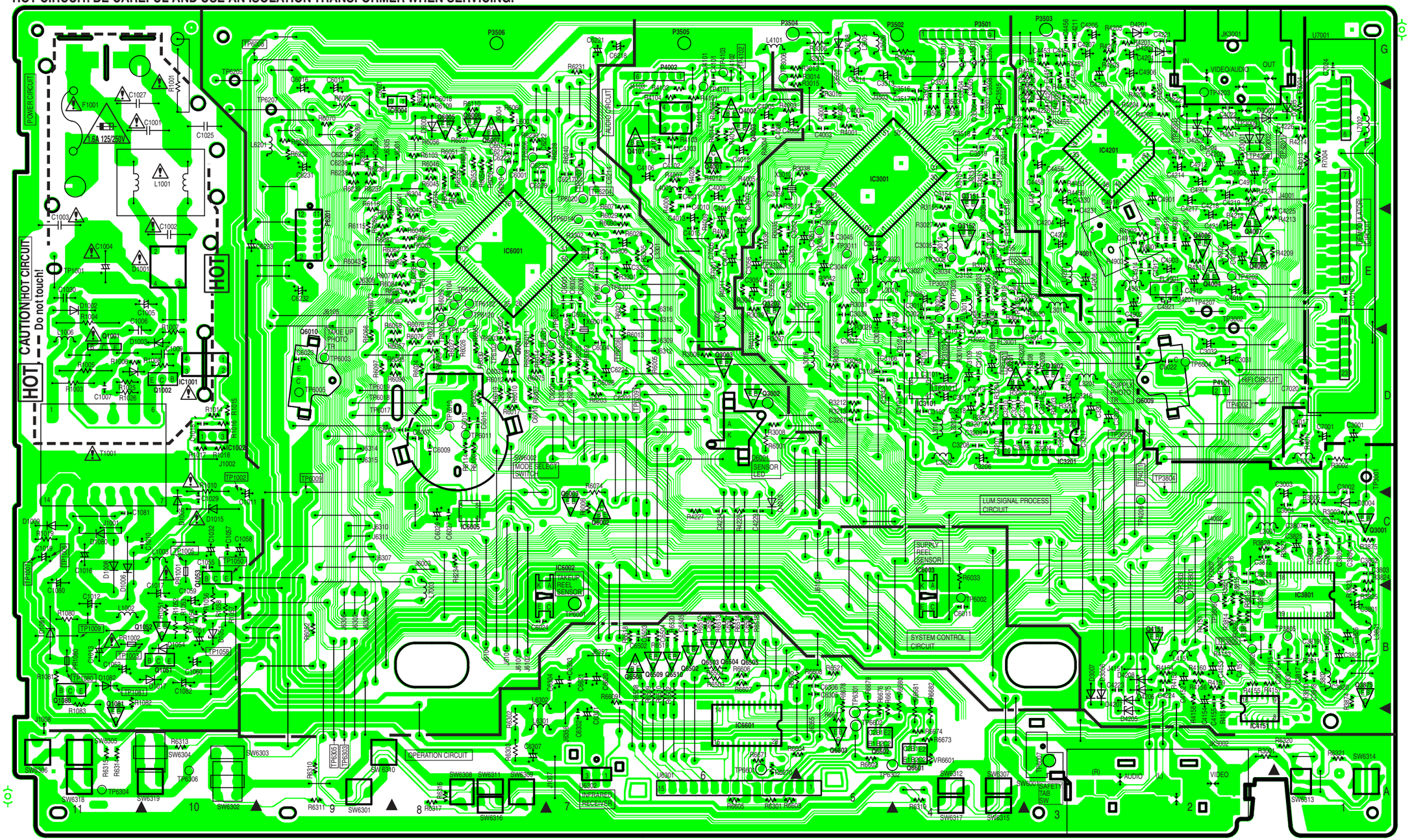
NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

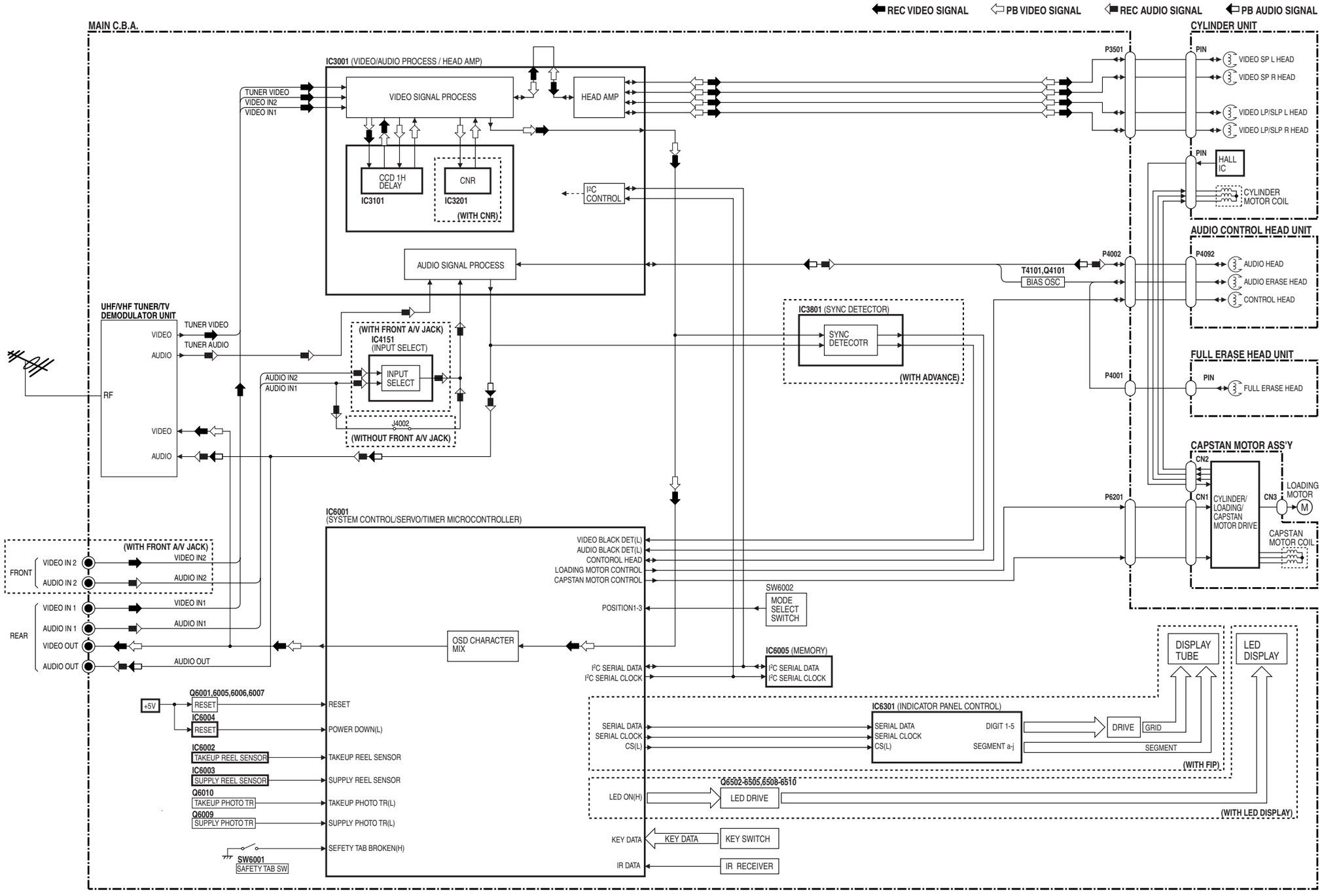
COMPARISON CHART
OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G

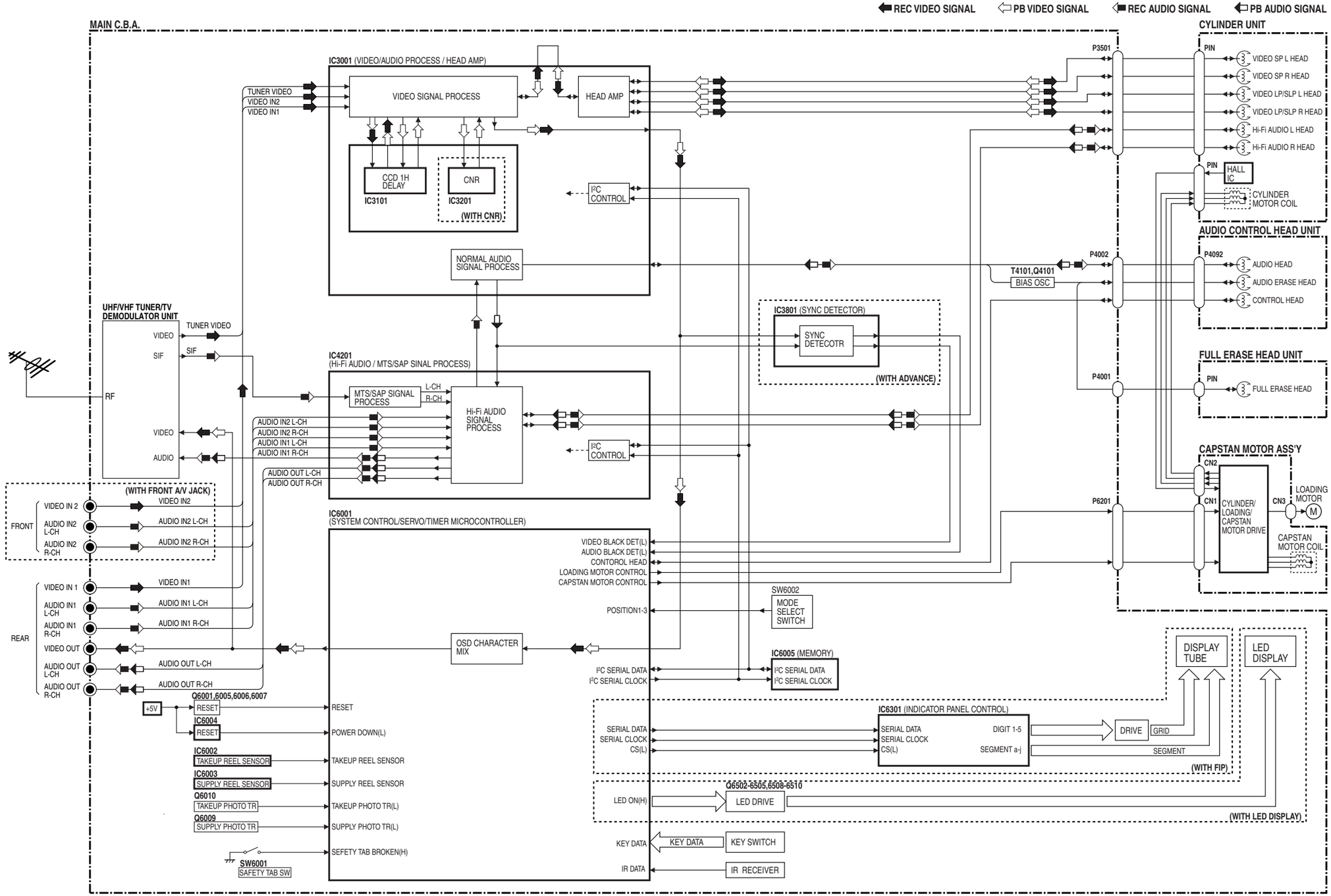
HOT CIRCUIT. BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.



OVERALL BLOCK DIAGRAM



OVERALL BLOCK DIAGRAM



1. **Important safety notice**
   Components identified by the sign ⚠ have special characteristics important for safety. When replacing any of these components. Use only the specified parts.

2. Do not use the part number shown on this drawing for ordering.
   The correct part number and part value is shown in the parts list, and may be slightly different or amended since this drawing was prepared.

3. Use only original replacement parts:
   To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

4. Parts different in shape or size may be used.
   However, only interchangeable parts will be supplied as service replacement parts.

5. Test point information
   ● : Test point with a jumper wire across a hole in P.C.B.
   ○ : Test point with no test pin.

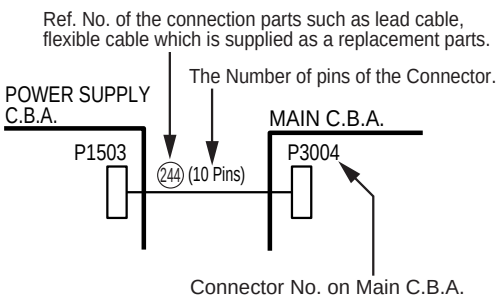
Schematic Diagram Notes

1. Indication for Zener Voltage of Zener Diodes
   The Zener Voltage of Zener Diodes are indicated as such on Schematic Diagrams.

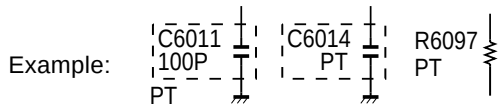
   Example:
   (6.2V).....Zener Voltage

2. How to identify Connectors
   Each connector is labeled with a Connector No. and Pin No. Indicating what it is connected to,
   in other words, its counter part.
   Use the interconnection schematic diagram to find the connection between associated connectors.

   Example:
   The connections between C.B.A.s are shown below.


Ref. No. of the connection parts such as lead cable, flexible cable which is supplied as a replacement parts.
The Number of pins of the Connector.
POWER SUPPLY C.B.A.
MAIN C.B.A.
P1503
(244) (10 Pins)
P3004
Connector No. on Main C.B.A.

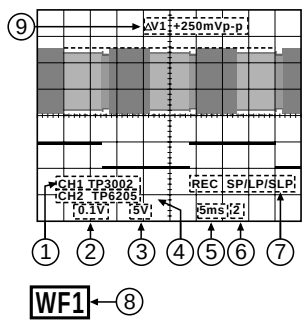
3. Parts marked "PT" are not used in any models included in this service model.



4. Jumper wires are used for WA10, WA5 etc and these are not supplied as replacement parts.

Signal Waveform Note

How to read Signal Waveform



① Connecting Point
② Volts/Div
③ Volts/Div
④ Connecting Point
⑤ Time/Div
⑥ Trigger Channel of the scope
(1:CH1,2:CH2)
⑦ Operation Mode of VCR
⑧ Waveform Point on Schematic
⑨ ΔV1:Peak to Peak

Circuit Board Layout Note

Circuit Board Layout shows components installed for various models.
For proper parts content for the model you are servicing, please refer to the schematic diagram and parts list.

NOTE:
Circuit Board Layout includes components which are not used.

Model No. Identification Mark

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

Note : Refer to item 3 of Schematic Diagram Notes for mark "PT".

MAIN I (SYSTEM CONTROL/ SERVO) SCHEMATIC DIAGRAM

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

A,B

KEY VOLTAGE CHART (SW6303, 6304, 6305, 6310, 6311, 6314, 6315, 6317)

TERMINAL VOLTAGE	0V ~ 0.6V	0.7V ~ 1.9V	2.0V ~ 3.1V	3.2V ~ 4.4V
KEY DATA1 (PIN 89)	-----	REW	FF	-----
KEY DATA2 (PIN 88)	-----	STOP/EJECT	PLAY	-----
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----	POWER

D

KEY VOLTAGE CHART (SW6301, 6303, 6304, 6305, 6306, 6307, 6312, 6314, 6316)

TERMINAL VOLTAGE	0V ~ 0.6V	0.7V ~ 1.9V	2.0V ~ 3.1V	3.2V ~ 4.4V
KEY DATA1 (PIN 89)	-----	REC	STOP/EJECT	-----
KEY DATA2 (PIN 88)	-----	REW	PLAY	FF
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	TV/VCR	CH UP	-----	POWER

C,E,F,G

KEY VOLTAGE CHART (SW6303, 6304, 6305, 6306, 6311, 6314, 6315, 6317)

TERMINAL VOLTAGE	0V ~ 0.6V	0.7V ~ 1.9V	2.0V ~ 3.1V	3.2V ~ 4.4V
KEY DATA1 (PIN 89)	-----	-----	STOP/EJECT	-----
KEY DATA2 (PIN 88)	-----	REW	PLAY	FF
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----	POWER

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

※1 Microcontroller IC (IC6001) and EEP ROM IC (IC6005) replacement note for PV-V4022-K and PV-V4522-K:
In early units, MN101D06FPK is used for Microcontroller IC (IC6001).
In later units, MN101D09EPA is used for Microcontroller IC (IC6001).
Please note that only MN101D09EPA is supplied as a replacement part and this can be used with both types of EEP ROM IC (IC6005).
When replacing EEP ROM IC (IC6005), be sure to confirm which type of Microcontroller IC (IC6001) is used on the unit you are servicing and install the proper part for EEP ROM IC (IC6005).

	Microcontroller IC (IC6001)	EEPROM IC (IC6005)
Early Unit	MN101D06FPK	LSEQ0642
Later Unit	MN101D09EPA	KS24C011CS or AT24C01A10SI or C0ZBZ0000015 or C3EBCC000038 or KS24C011IS or M24C01-MN6

MODE SELECT SWITCH

PIN NO. OF IC6001 / MODE	A (97)	B (96)	C (95)
FF/REW	H	H	L
BRAKE	L	H	H
PLAY/CUE/SLOW/STILL	L	H	L
REVIEW	H	L	L
STANDBY/STOP	H	L	H
CASSETTE DOWN	L	L	H
EJECT	L	L	L

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

*3 27V during High Speed search for PV-V4622.

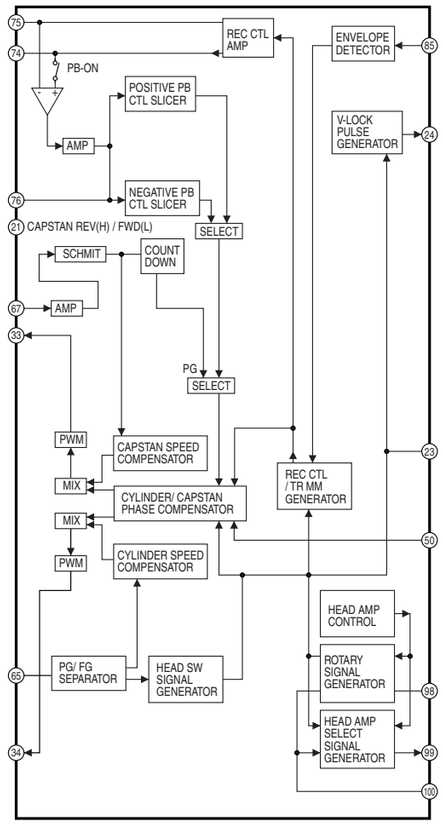
LSJB2006
PV-V4022-K/PV-V4522-K
/PV-V462/PV-V4602
/PV-V4612S/PV-V4612-K/PV-V4622
MAIN I (SYSTEM CONTROL
/SERVO) SCHEMATIC DIAGRAM

I/O CHART OF IC6001

Pin No.	I/O	Signal Name	Description
1	I	POWER_DOWN_L	POWER DOWN(L)
2	O	E/V-MASK	REW LED ON(H)/E/V-MASK
3	I	T-REEL	TAKEUP REEL PULSE
4	I	S-REEL	SUPPLY REEL PULSE
5	I	IR-DATA	IR-DATA
6	-	NC	(Not used)
7	-	NC	(Not used)
8	-	NC	(Not used)
9	-	NC	(Not used)
10	-	NC	(Not used)
11	O	SCK_1	SERIAL CLOCK 1
12	O	SLAVE_DATA_1	SERIAL DATA 1
13	O	MASTER_DATA_1	SERIAL DATA 0
14	O	LD_CTL	LOADING MOTOR CONTROL REVERSE(L)/STOP(M)/FORWARD(H)
15	O	LED_F&G	FF LED ON(H)
16	O	TV_L/VCR_H	TV(L)/VCR(H)
17	I/O	IIC_DATA	I2C SERIAL DATA
18	O	IIC_CLK	I2C SERIAL CLOCK
19	O	INPUT2	INPUT SELECT 2
20	O	DEFEAT_H	AUDIO DEFEAT(H)
21	O	CAP_R/F	CAPSTAN MOTOR REVERSE(H)/FORWARD(L)
22	O	A-MUTE_H	AUDIO MUTE(H)
23	O	HSW	HEAD SW
24	O	V-LOCKPLS	V-LOCK PULSE
25	I	RST	RESET
26	O	1/4_OSC	3.58MHz
27	O	HIFI-HSW	Hi-Fi HEAD SW
28	O	V-D-REC_H	VIDEO DELAY REC(H)
29	I	HIFI-PB_H	Hi-Fi PB(H)
30	I	S-TAB	SAFETY TAB BROKEN(H)
31	I/O	BLACK-DET-V/LED_B	VIDEO BLACK DETECT(L)/VCR LED ON(H)
32	I/O	BLACK-DET-A/LED_C	AUDIO BLACK DETECT(L)/TIMER LED ON(H)
33	O	PWM1(CAP)	CAP ERROR
34	O	PWM0(CYL)	CYL ERROR
35	O	PANE_CLK/LED_K	PANEL CLOCK/REC LED ON(H)
36	I	DVDD	VDD
37	O	OSC_OUT	OSC 2
38	I	OSC_IN	OSC 1
39	-	DVSS	GND
40	I	KEY12	KEY DATA 12
41	I	KEY13	KEY DATA 13
42	-	SXI	SXI
43	-	NC	(Not used)
44	-	NC	(Not used)
45	-	NC	(Not used)
46	-	NC	(Not used)
47	O	CV_OUT	VIDEO
48	-	OSD_VSS	GND
49	I	CV_IN	VIDEO
50	I	CV_IN2	V-SYNC

Pin No.	I/O	Signal Name	Description
51	I	OSD_VDD	VDD
52	O	AFCC	AFC
53	I	AFCLPF	AFC
54	O	PANE_CS	PANEL CS(L)
55	O	3CH_HIZ/4CH_L	CH3(H)/CH4(L)
56	-	NC	(Not used)
57	-	NC	(Not used)
58	-	NC	(Not used)
59	-	NC	(Not used)
60	-	NC	(Not used)
61	-	NC	(Not used)
62	-	NC	(Not used)
63	-	NC	(Not used)
64	-	NC	(Not used)
65	I	PFG	CYL PG/FG
66	O	C/R/SS_L	CUE/REV/SS(L)
67	I	FGF	CAP FG
68	-	AFG	CAP FG
69	O	VRO	V-REF 1
70	-	VRI	V-REF 2
71	-	AVSS	VSS
72	-	CTLA	CTL AMP
73	I	AVDD	VDD
74	I/O	RCTLP	CTL PULSE(+)
75	-	RCTLN	CTL PULSE(-)
76	-	CO	PB CONTROL PULSE
77	-	NC	(Not used)
78	-	NC	(Not used)
79	I	T-PHOTO_L	TAKEUP PHOTO TR(L)
80	I	S-PHOTO_L	SUPPLY PHOTO TR(L)
81	I	DTS-AFC	AFC
82	I	MTS_MODE	MTS MODE
83	O	POWER-ON_L	POWER ON(L)
84	O	SW+27V ON(H)	It get (H) during High Speed search for PV-V4622.
85	I	AT_ENV	ENV-VOLTAGE
86	I	KEY4	KEY DATA 4
87	I	KEY3	KEY DATA 3
88	I	KEY2	KEY DATA 2
89	I	KEY1	KEY DATA 1
90	I	KEY11	KEY DATA 11
91	I	KEY10	KEY DATA 10
92	O	LED_H&I&J	PLAY LED ON(H)
93	O	SCAN1/CATV_DATA	SCAN 1
94	O	SCAN2/CATV_CS	SCAN 2
95	I	POS.3	MODE SW POSITION C
96	I	POS.2	MODE SW POSITION B
97	I	POS.1	MODE SW POSITION A
98	O	ROT	ROTARY SW
99	O	HAMP	HEAD AMP SW
100	I	DENV	ENVELOPE DET

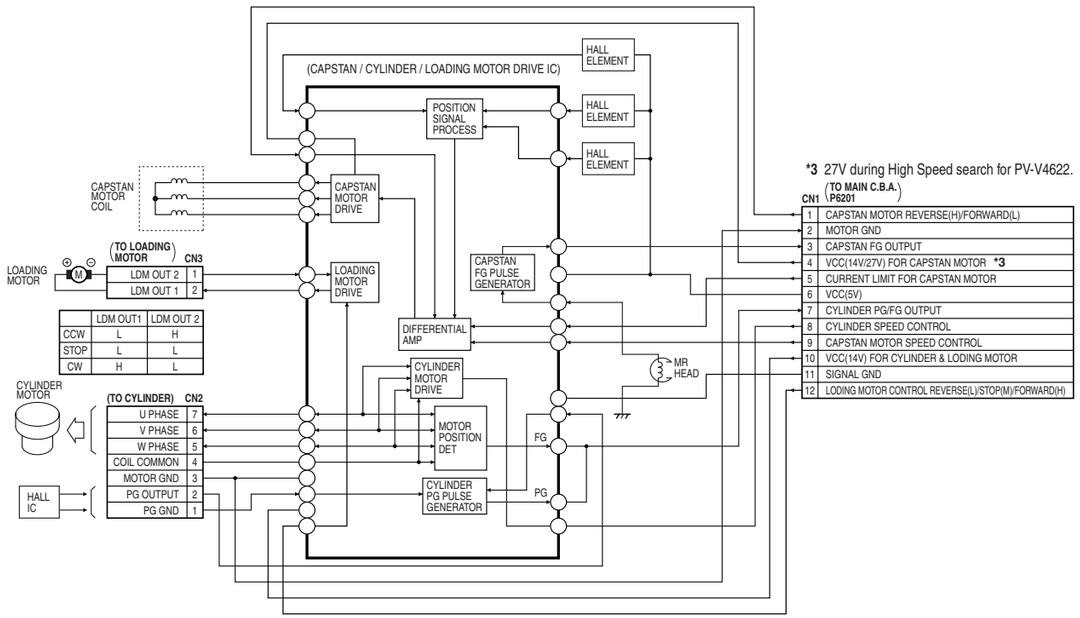
IC6001 SERVO BLOCK DIAGRAM



CAPSTAN MOTOR ASS'Y

NOTE:
CAPSTAN MOTOR ASS'Y (REF. NO. 46) IS SUPPLIED AS A UNIT ONLY.
HOWEVER, THE FLAT FLEXIBLE CABLE (REF. NO. 48) IS AVAILABLE SEPARATELY AS A REPLACEMENT PART.

"FOR REFERENCE ONLY"



MAIN II (SIGNAL PROCESS/AUDIO) SCHEMATIC DIAGRAM

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

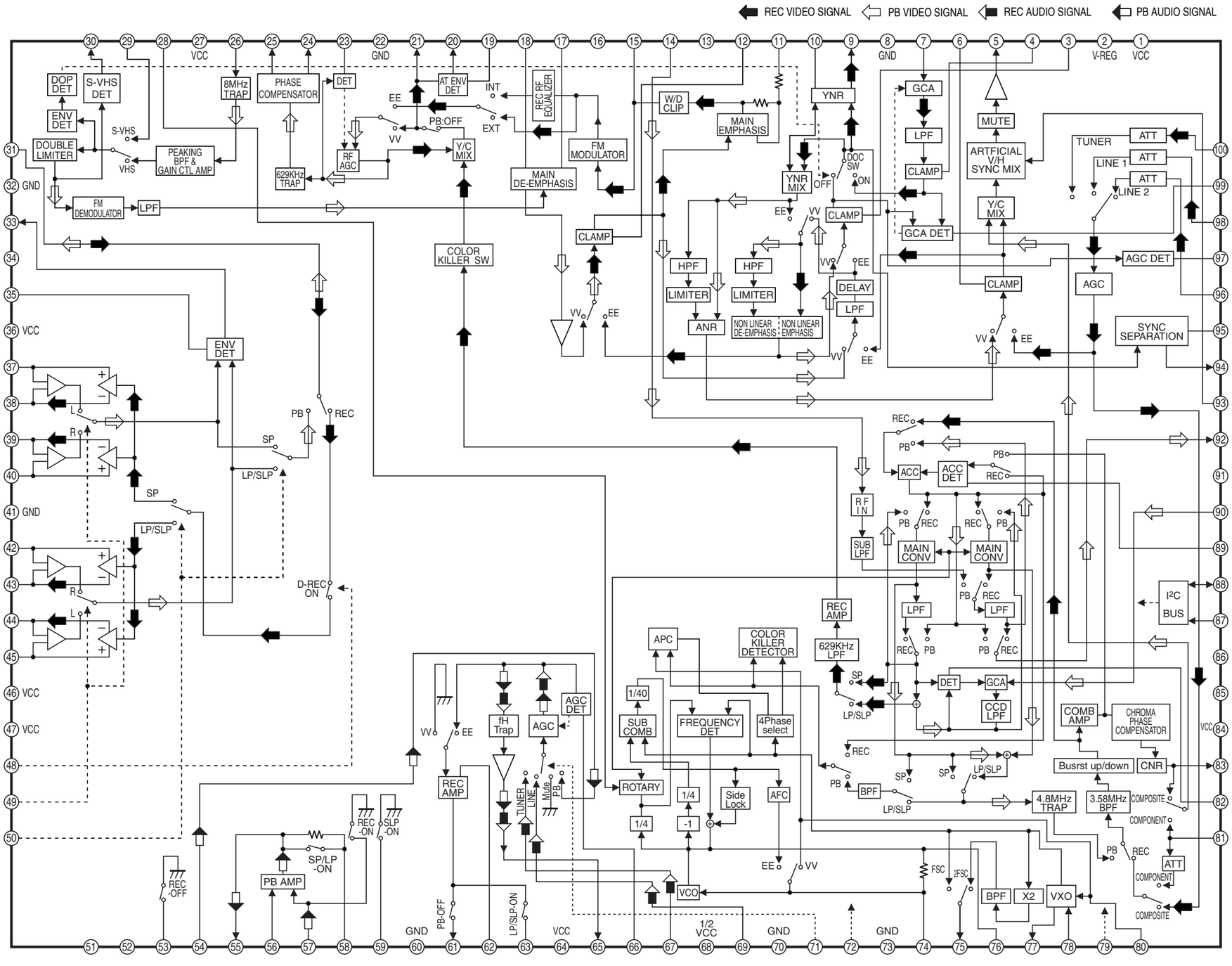
MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

REC VIDEO SIGNAL ⇦ PB VIDEO SIGNAL ⇦ REC AUDIO SIGNAL ⇦ PB AUDIO SIGNAL ⇦ CAPSTAN SERVO

LSJB2006

PV-V4022-K/PV-V4522-K
/PV-V462/PV-V4602
/PV-V4612S/PV-V4612-K/PV-V4622
MAIN II (SIGNAL PROCESS/ AUDIO) SCHEMATIC DIAGRAM

IC3001 VIDEO/AUDIO SIGNAL PROCESS / HEAD AMP IC- DETAIL BLOCK DIAGRAM



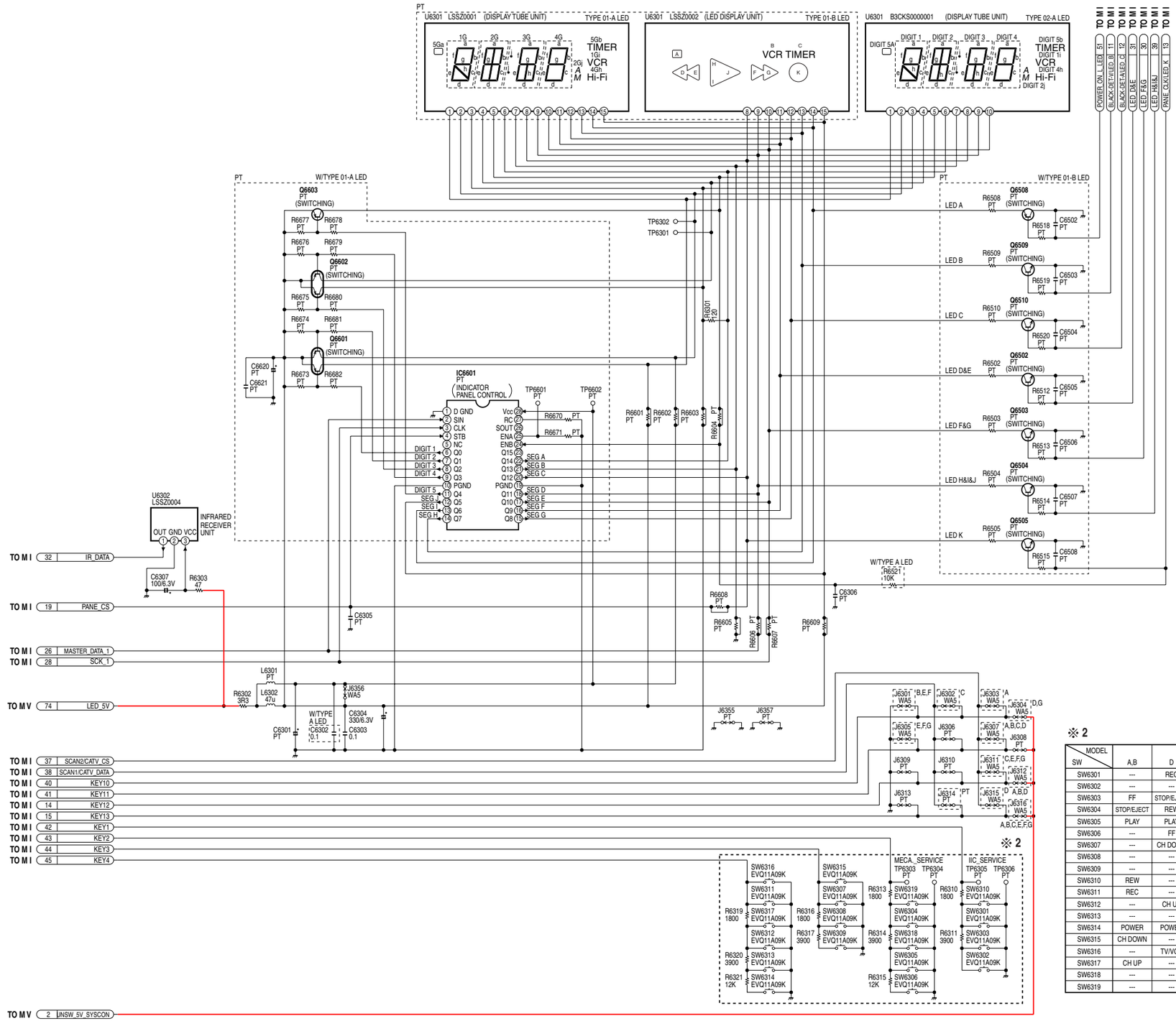
MAIN III (OPERATION) SCHEMATIC DIAGRAM

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT



※2

SW \ MODEL	A,B	D	C,E,F,G
SW6301	---	REC	---
SW6302	---	---	---
SW6303	FF	STOP/EJECT	STOP/EJECT
SW6304	STOP/EJECT	REW	REW
SW6305	PLAY	PLAY	PLAY
SW6306	---	FF	FF
SW6307	---	CH DOWN	---
SW6308	---	---	---
SW6309	---	---	---
SW6310	REW	---	---
SW6311	REC	---	REC
SW6312	---	CH UP	---
SW6313	---	---	---
SW6314	POWER	POWER	POWER
SW6315	CH DOWN	---	CH DOWN
SW6316	---	TV/VCR	---
SW6317	CH UP	---	CH UP
SW6318	---	---	---
SW6319	---	---	---

LSJB2006
PV-V4022-K/PV-V4522-K/PV-V462
/PV-V4602/PV-V4612S/PV-V4612-K/PV-V4622
MAIN III (OPERATION) SCHEMATIC DIAGRAM

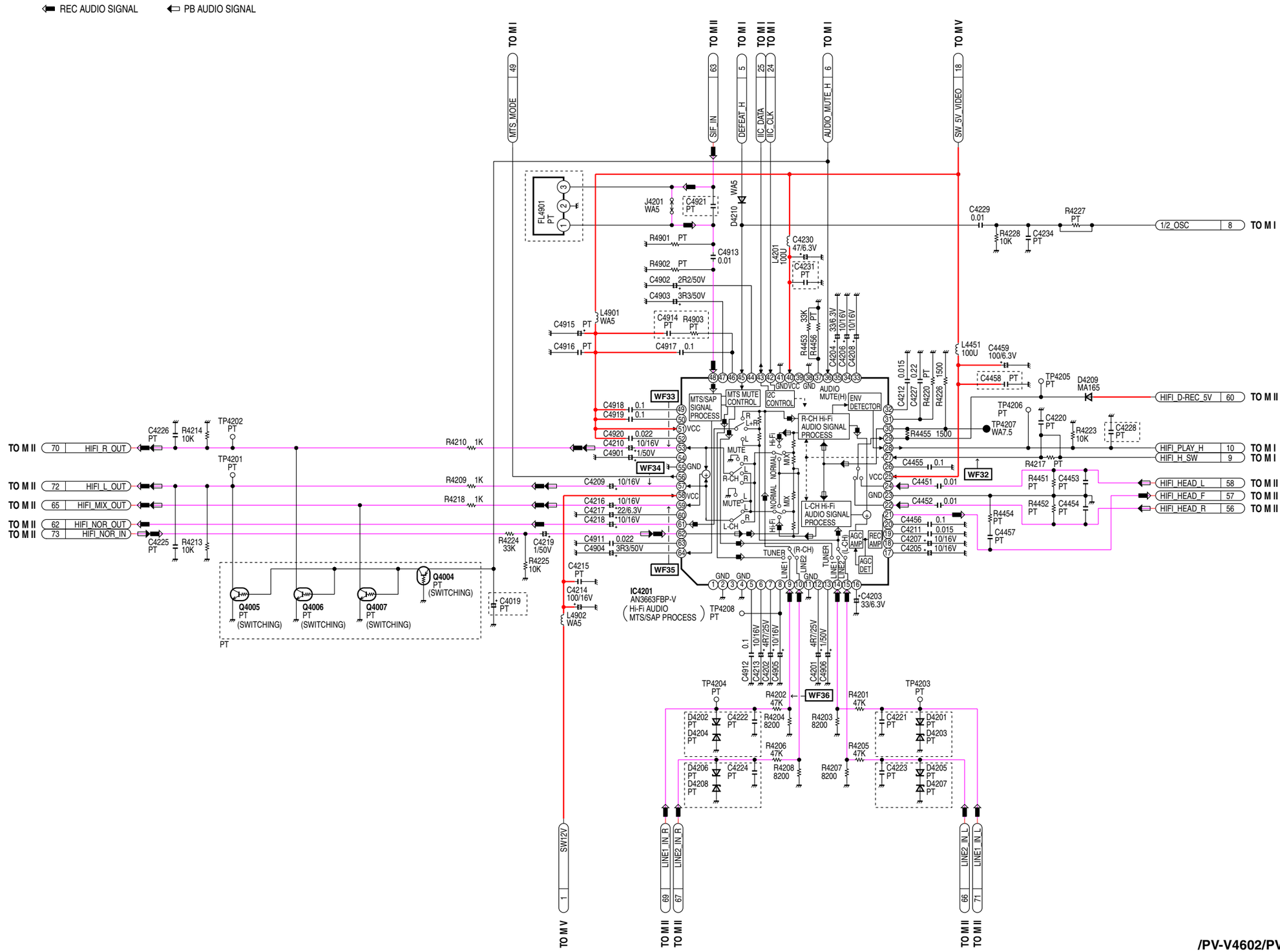
MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM (B,C,D,E,F,G)

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT



LSJB2006
PV-V4522-K/PV-V462
/PV-V4602/PV-V4612S/PV-V4612-K/PV-V4622
MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM

MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

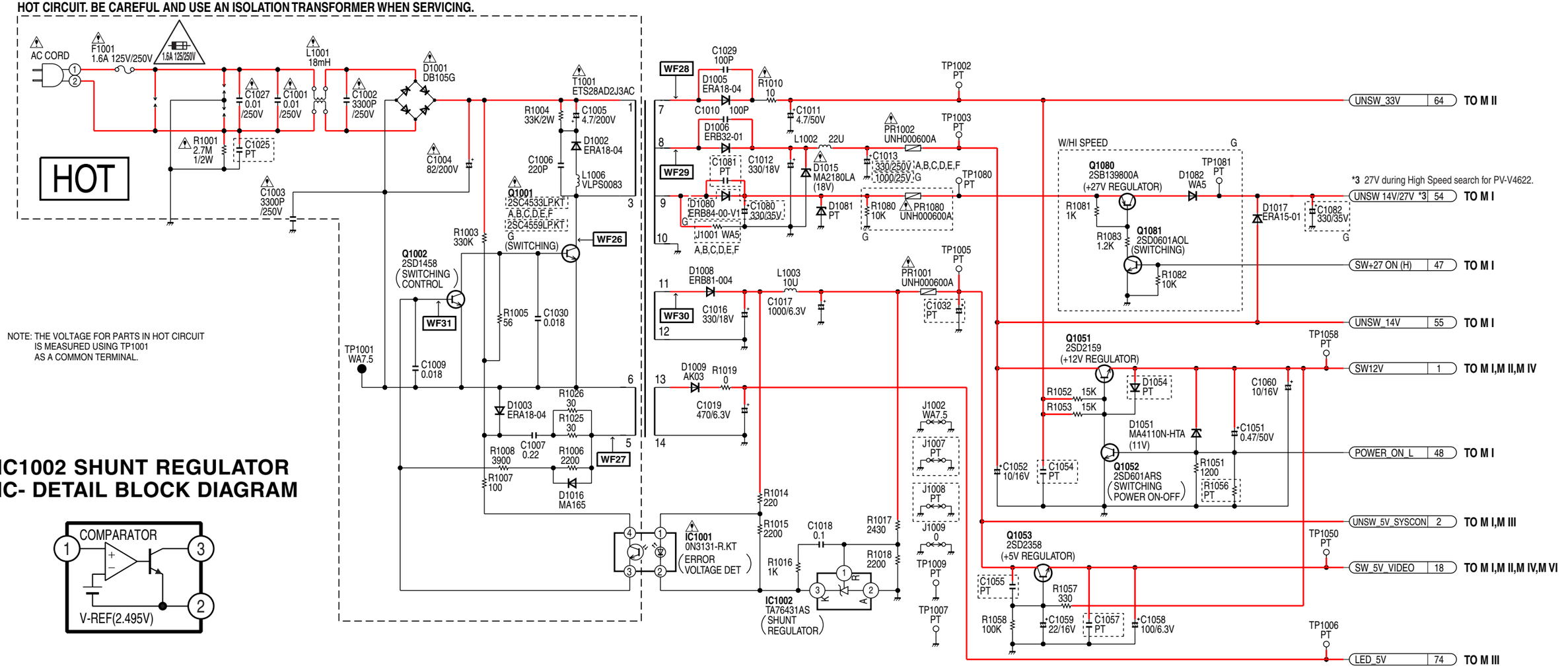
COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE 1.6A 125/250V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'T INCENDIE N'I UTILISERQUE DES FUSIBLE DE MÉME TYPE 1.6A 125/250V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

HOT CIRCUIT. BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.



NOTE: THE VOLTAGE FOR PARTS IN HOT CIRCUIT IS MEASURED USING TP1001 AS A COMMON TERMINAL.

IC1002 SHUNT REGULATOR IC- DETAIL BLOCK DIAGRAM

LSJB2006
PV-V4022-K/PV-V4522-K/PV-V462
/PV-V4602/PV-V4612S/PV-V4612-K/PV-V4622
MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

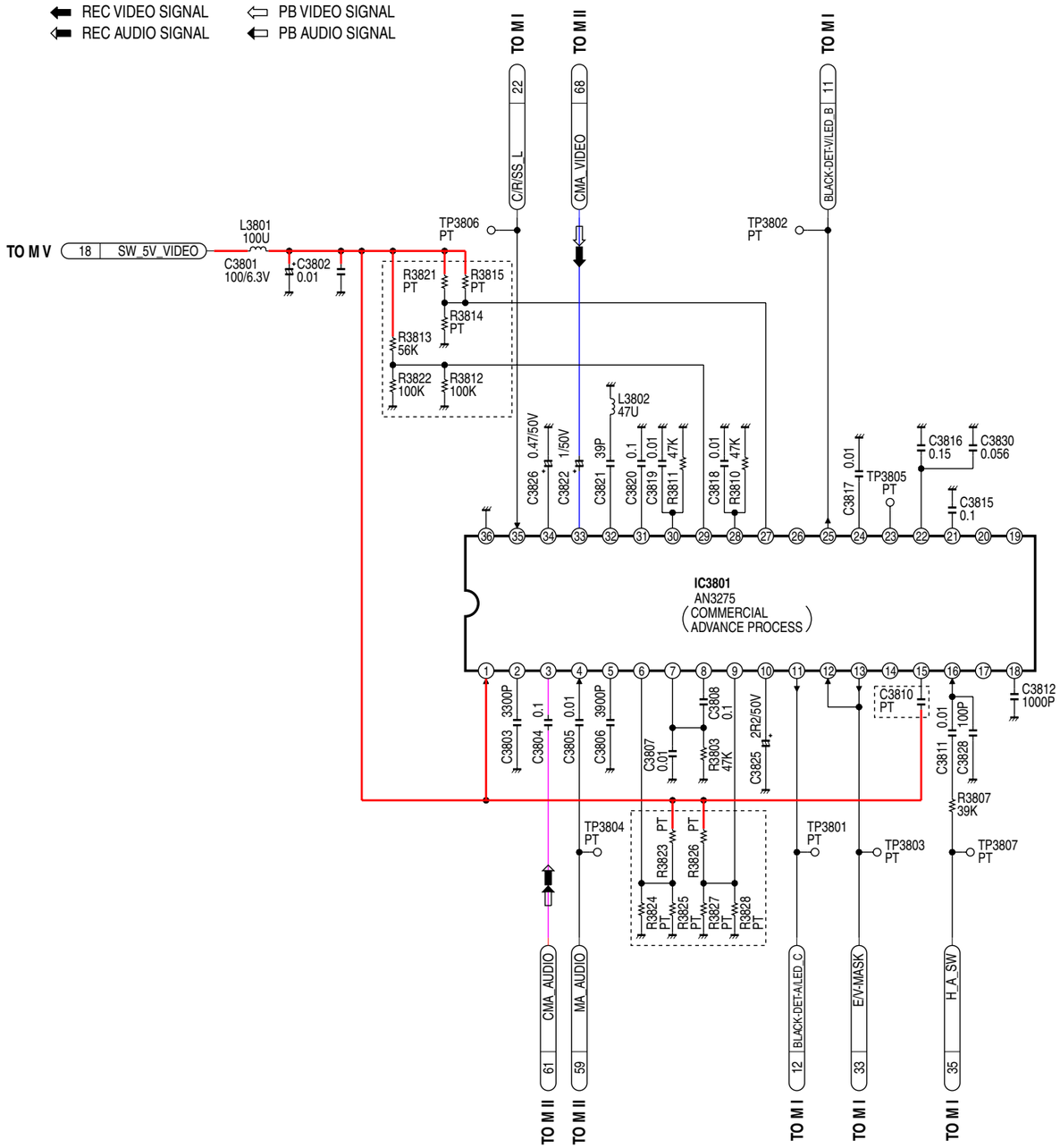
MAIN VI (ADVANCE) SCHEMATIC DIAGRAM (E,F,G)

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

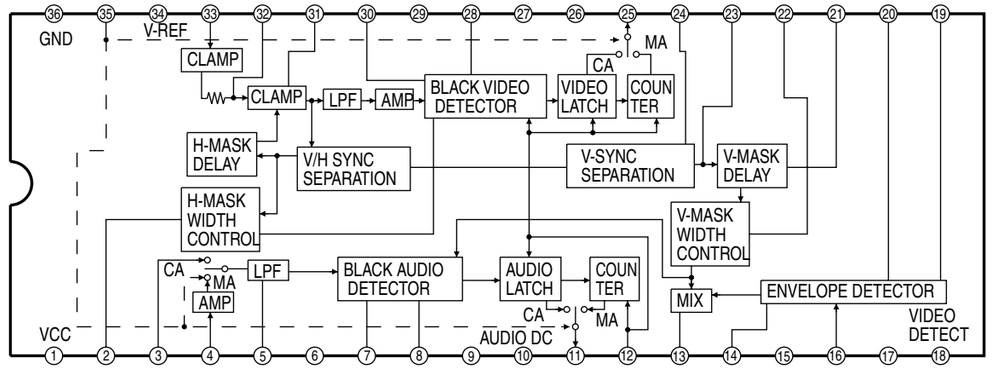
NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT



IC3801 COMMERCIAL ADVANCE PROCESS IC- DETAIL BLOCK DIAGRAM



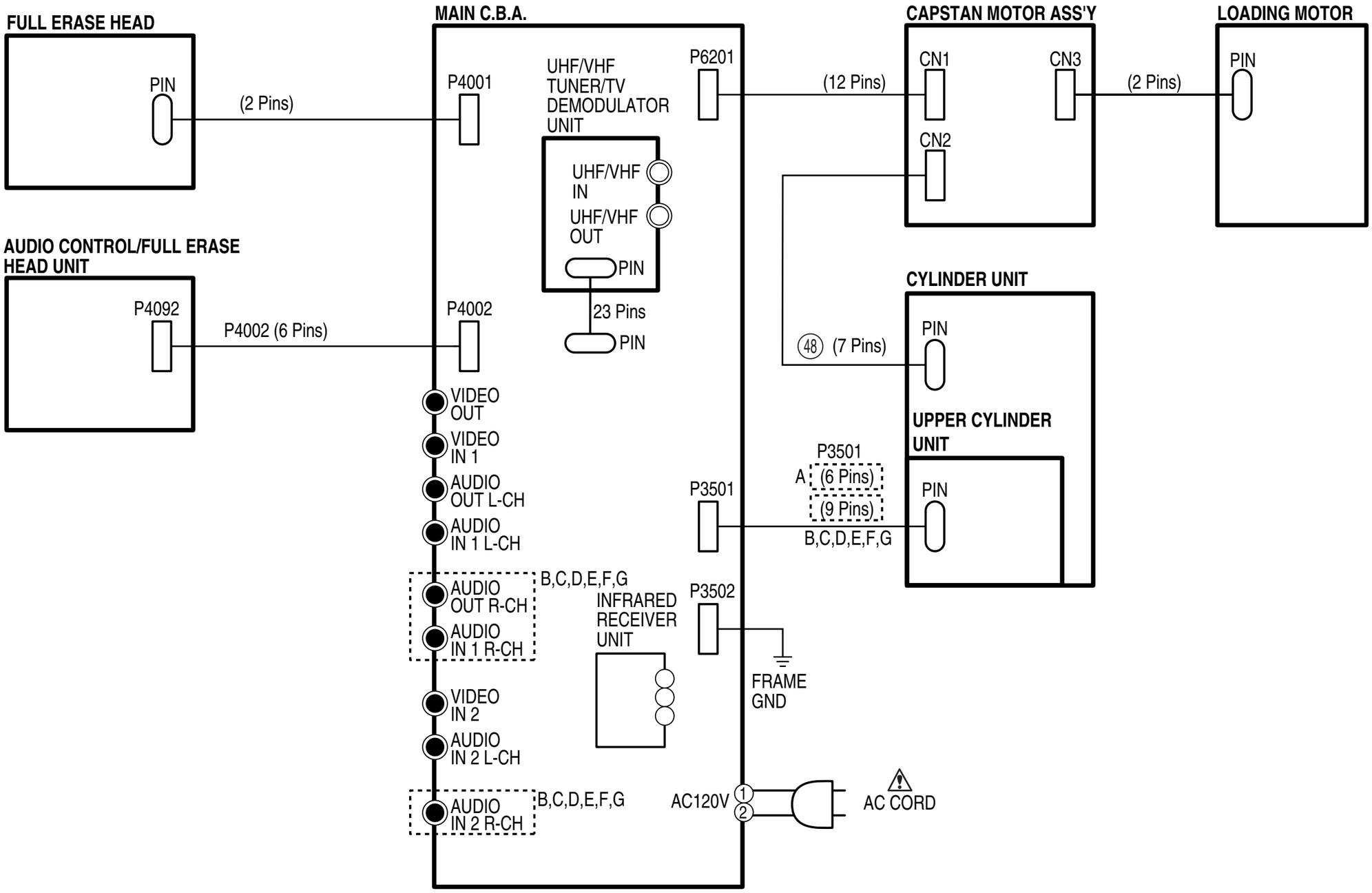
INTERCONNECTION SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT



7.2. MAIN SCHEMATIC DIAGRAMS

MAIN I (SYSTEM CONTROL/ SERVO) SCHEMATIC DIAGRAM

A,B

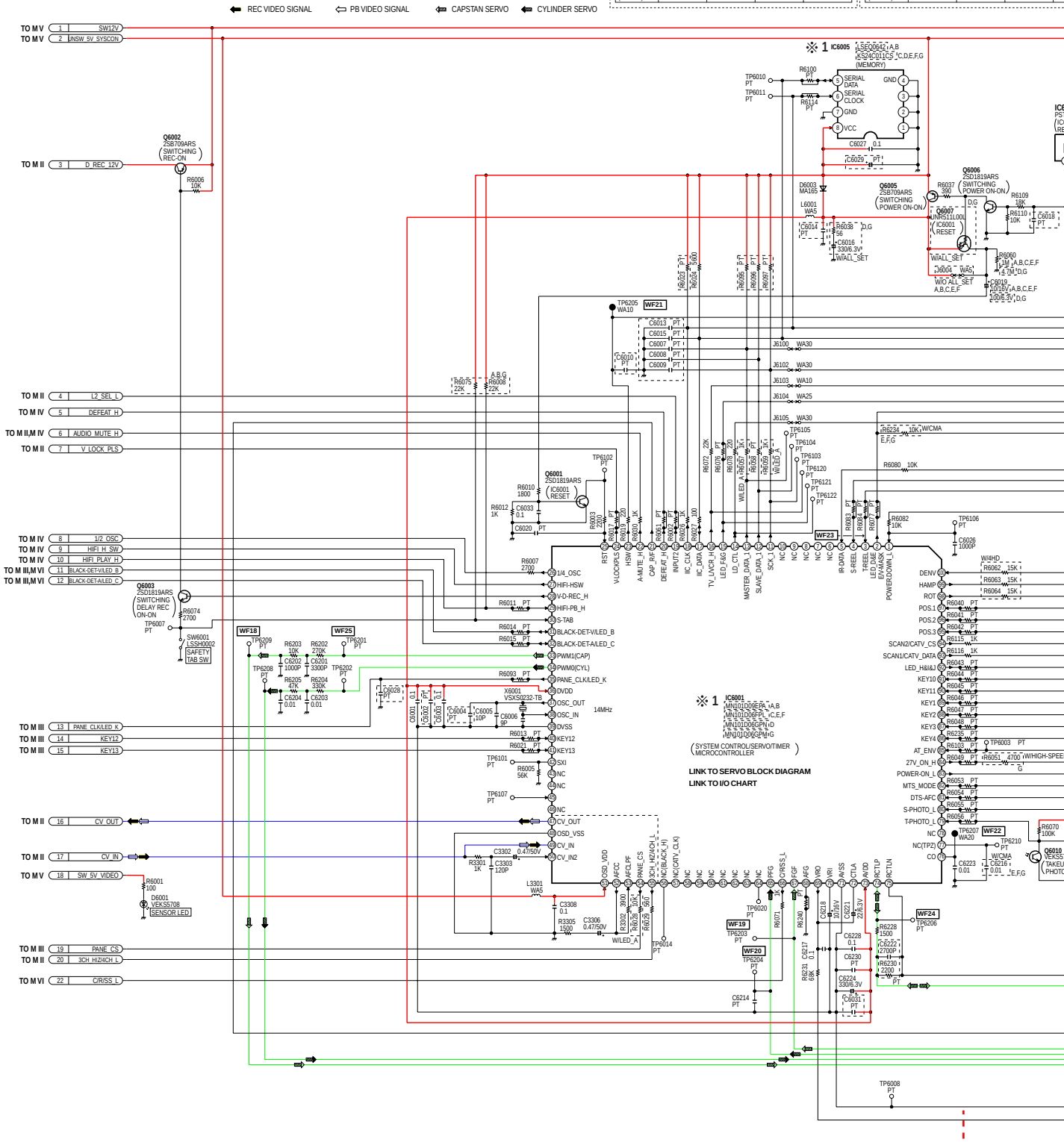
KEY VOLTAGE CHART (SW6303, 6304, 6305, 6310, 6311, 6314, 6315, 6317)

TERMINAL VOLTAGE	0V～0.6V	0.7V～1.9V	2.0V～3.1V	3.2V～4.4V
KEY DATA1 (PIN 89)	-----	REW	FF	-----
KEY DATA2 (PIN 88)	-----	STOP/EJECT	PLAY	-----
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----	POWER

D

KEY VOLTAGE CHART (SW6301, 6303, 6304, 6305, 6306, 6307

TERMINAL VOLTAGE	0V～0.6V	0.7V～1.9V	2.0V～3.1V	3.
KEY DATA1 (PIN 89)	-----	REC	STOP/EJECT	
KEY DATA2 (PIN 88)	-----	REW	PLAY	
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	
KEY DATA4 (PIN 86)	TV/VCR	CH UP	-----	



NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

❖1 Microcontroller IC (IC6001) and EEP ROM IC (IC6005) replacement note for PV-V4022-K and PV-V4522-K:
In early units, MN101D06FPK is used for Microcontroller IC (IC6001).
In later units, MN101D09EPA is used for Microcontroller IC (IC6001).
Please note that only MN101D09EPA is supplied as a replacement part and this can be used with both types of EEP ROM IC (IC6005).
When replacing EEP ROM IC (IC6005), be sure to confirm which type of Microcontroller IC (IC6001) is used on the unit you are servicing and install the proper part for EEP ROM IC (IC6005).

	Microcontroller IC (IC6001)	EEPROM IC (IC6005)
Early Unit	MN101D06FPK	LSEQ0642
Later Unit	MN101D09EPA	KS24C011CS or AT24C01A10SI or C0ZBZ0000015 or C3EBCC000038 or KS24C011IS or M24C01-MN6

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

KEY VOLTAGE CHART (SW6301, 6303, 6304, 6305, 6306, 6307, 6312, 6314, 6316)

TERMINAL VOLTAGE	0V～0.6V	0.7V～1.9V	2.0V～3.1V	3.2V～4.4V
KEY DATA1 (PIN 89)	-----	REC	STOP/EJECT	-----
KEY DATA2 (PIN 88)	-----	REW	PLAY	FF
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	TV/VCR	CH UP	-----	POWER

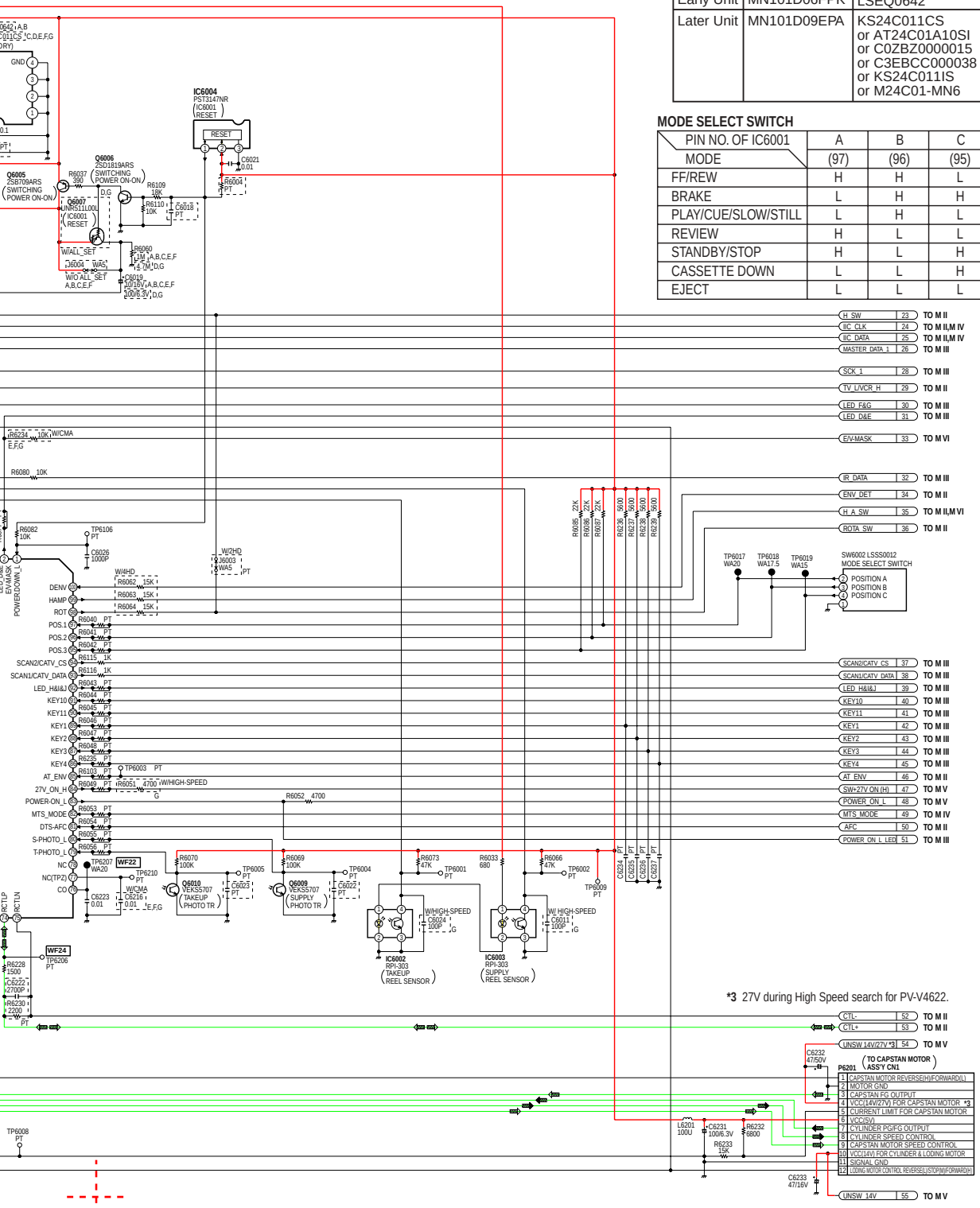
C,E,F,G

KEY VOLTAGE CHART (SW6303, 6304, 6305, 6306, 6311, 6314, 6315, 6317)

TERMINAL VOLTAGE	0V～0.6V	0.7V～1.9V	2.0V～3.1V	3.2V～4.4V
KEY DATA1 (PIN 89)	-----	-----	STOP/EJECT	-----
KEY DATA2 (PIN 88)	-----	REW	PLAY	FF
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----	POWER

MODE SELECT SWITCH

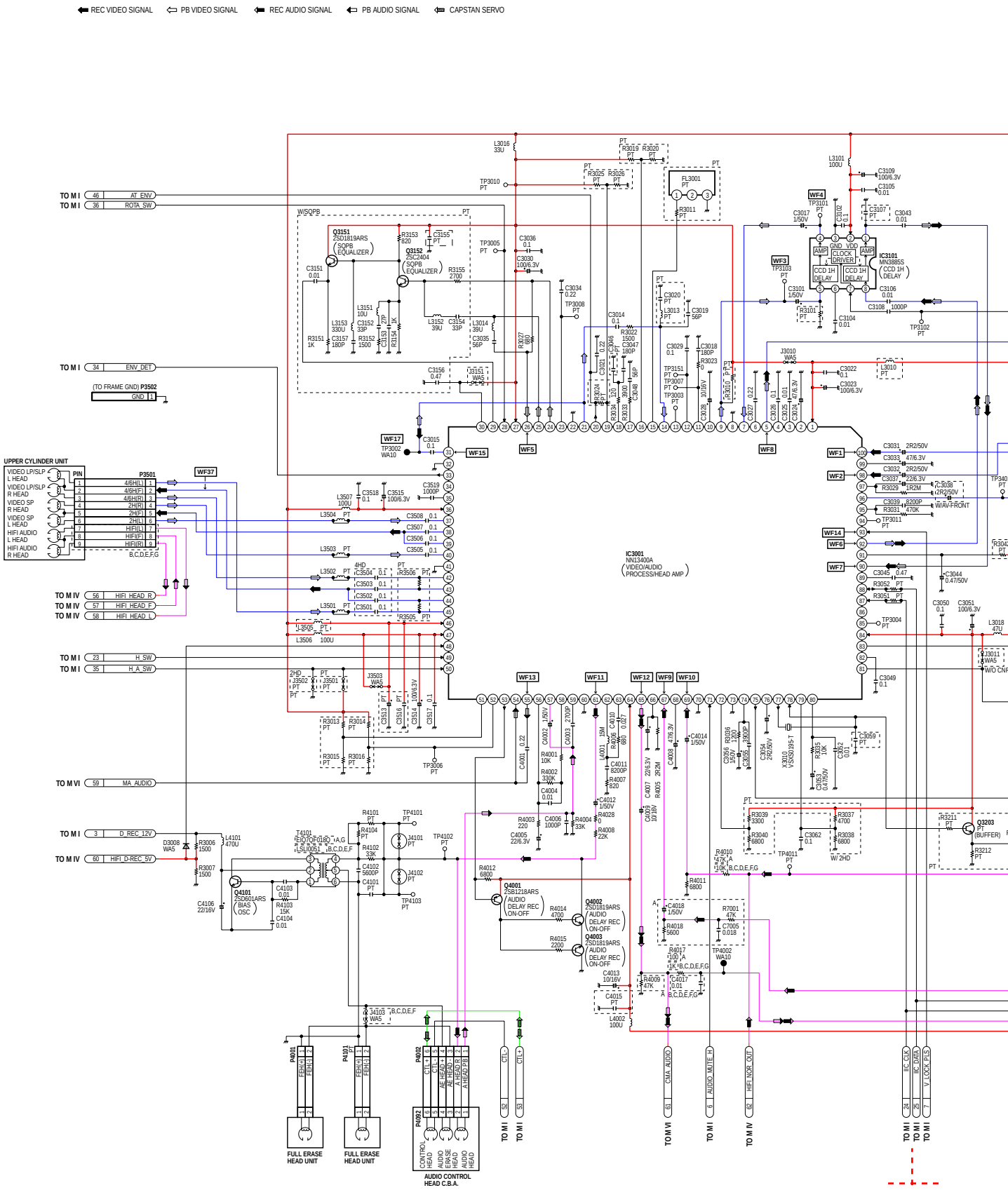
PIN NO. OF IC6001 / MODE	A (97)	B (96)	C (95)
FF/REW	H	H	L
BRAKE	L	H	H
PLAY/CUE/SLOW/STILL	L	H	L
REVIEW	H	L	L
STANDBY/STOP	H	L	H
CASSETTE DOWN	L	L	H
EJECT	L	L	H


IC6004 PST3147NR (IC6001 RESET)
Q6006 2SD1819ARS SWITCHING POWER ON-ON
Q6005 2SB709ARS SWITCHING POWER ON-ON
Q6007 UNR511L00L (IC6001 RESET)
W/ALL_SET
W/O ALL_SET
J6004 WA5
J6003 WA5
W/2HD
W/HD
W/CMA
W/HIGH-SPEED
W/ HIGH-SPEED
IC6002 RPI-303 (TAKEUP REEL SENSOR)
IC6003 RPI-303 (SUPPLY REEL SENSOR)
Q6010 VEKS5707 (TAKEUP PHOTO TR)
Q6009 VEKS5707 (SUPPLY PHOTO TR)
SW6002 LSSS0012 MODE SELECT SWITCH
POSITION A
POSITION B
POSITION C
WF22
WF24
P6201 (TO CAPSTAN MOTOR ASS'Y CN1)
H_SW 23 TO M II
IIC_CLK 24 TO M II,M IV
IIC_DATA 25 TO M II,M IV
MASTER_DATA_1 26 TO M III
SCK_1 28 TO M III
TV_L/VCR_H 29 TO M II
LED_F&G 30 TO M III
LED_D&E 31 TO M III
E/V-MASK 33 TO M VI
IR_DATA 32 TO M III
ENV_DET 34 TO M II
H_A_SW 35 TO M II,M VI
ROTA_SW 36 TO M II
SCAN2/CATV_CS 37 TO M III
SCAN1/CATV_DATA 38 TO M III
LED_H&I&J 39 TO M III
KEY10 40 TO M III
KEY11 41 TO M III
KEY1 42 TO M III
KEY2 43 TO M III
KEY3 44 TO M III
KEY4 45 TO M III
AT_ENV 46 TO M II
SW+27V ON (H) 47 TO M V
POWER_ON_L 48 TO M V
MTS_MODE 49 TO M IV
AFC 50 TO M II
POWER_ON_L_LED 51 TO M III
CTL- 52 TO M II
CTL+ 53 TO M II
UNSW 14V/27V *3 54 TO M V
UNSW 14V 55 TO M V
1 CAPSTAN MOTOR REVERSE(H)/FORWARD(L)
2 MOTOR GND
3 CAPSTAN FG OUTPUT
4 VCC(14V/27V) FOR CAPSTAN MOTOR *3
5 CURRENT LIMIT FOR CAPSTAN MOTOR
6 VCC(5V)
7 CYLINDER PG/FG OUTPUT
8 CYLINDER SPEED CONTROL
9 CAPSTAN MOTOR SPEED CONTROL
10 VCC(14V) FOR CYLINDER & LODING MOTOR
11 SIGNAL GND
12 LODING MOTOR CONTROL REVERSE(L)/STOP(M)/FORWARD(H)

*3 27V during High Speed search for PV-V4622.

LSJB2006
PV-V4022-K/PV-V4522-K
/PV-V462/PV-V4602
/PV-V4612S/PV-V4612-K/PV-V4622
MAIN I (SYSTEM CONTROL /SERVO) SCHEMATIC DIAGRAM

MAIN II (SIGNAL PROCESS/AUDIO) SCHEMATIC DIAGRAM

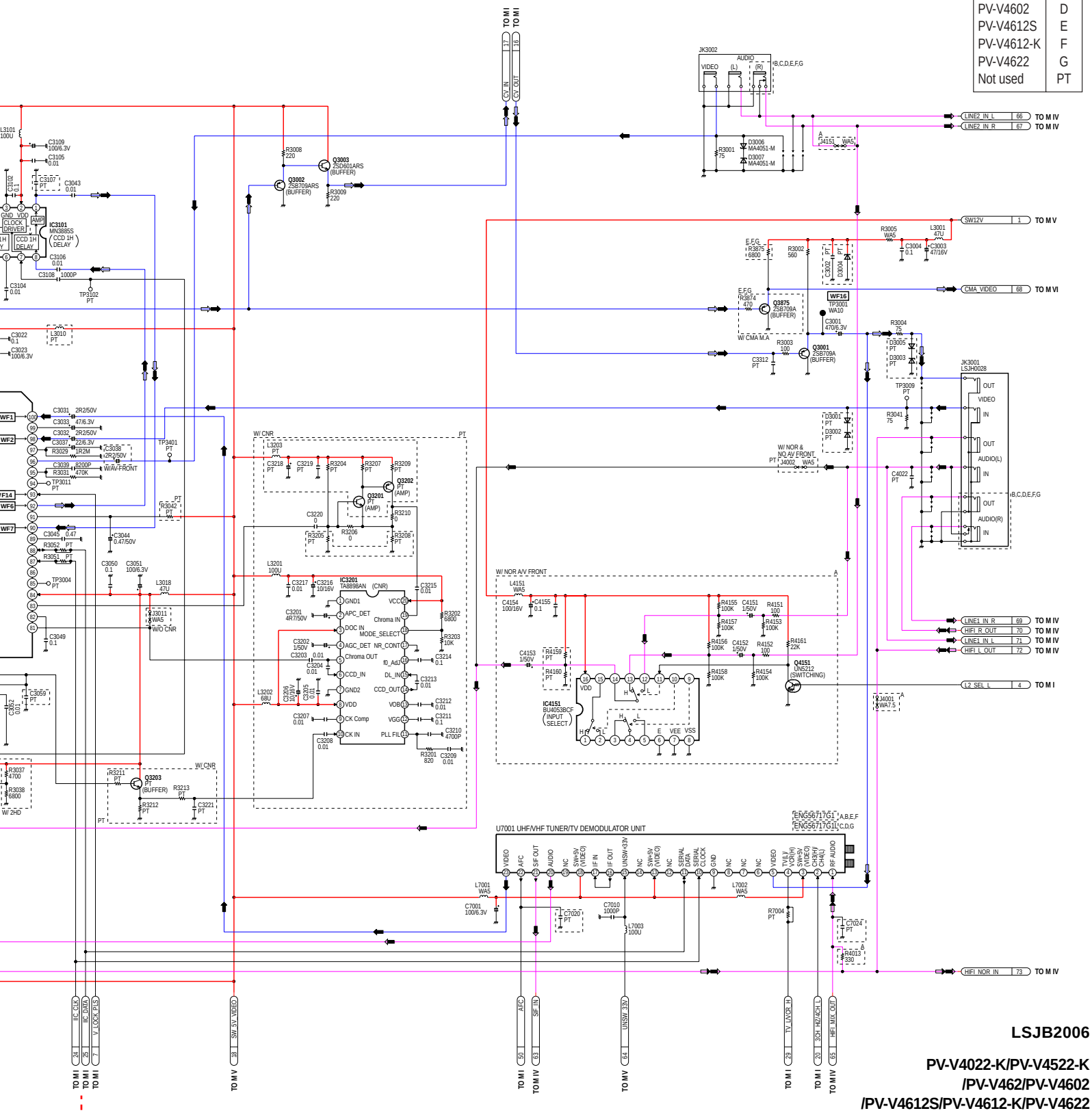


NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

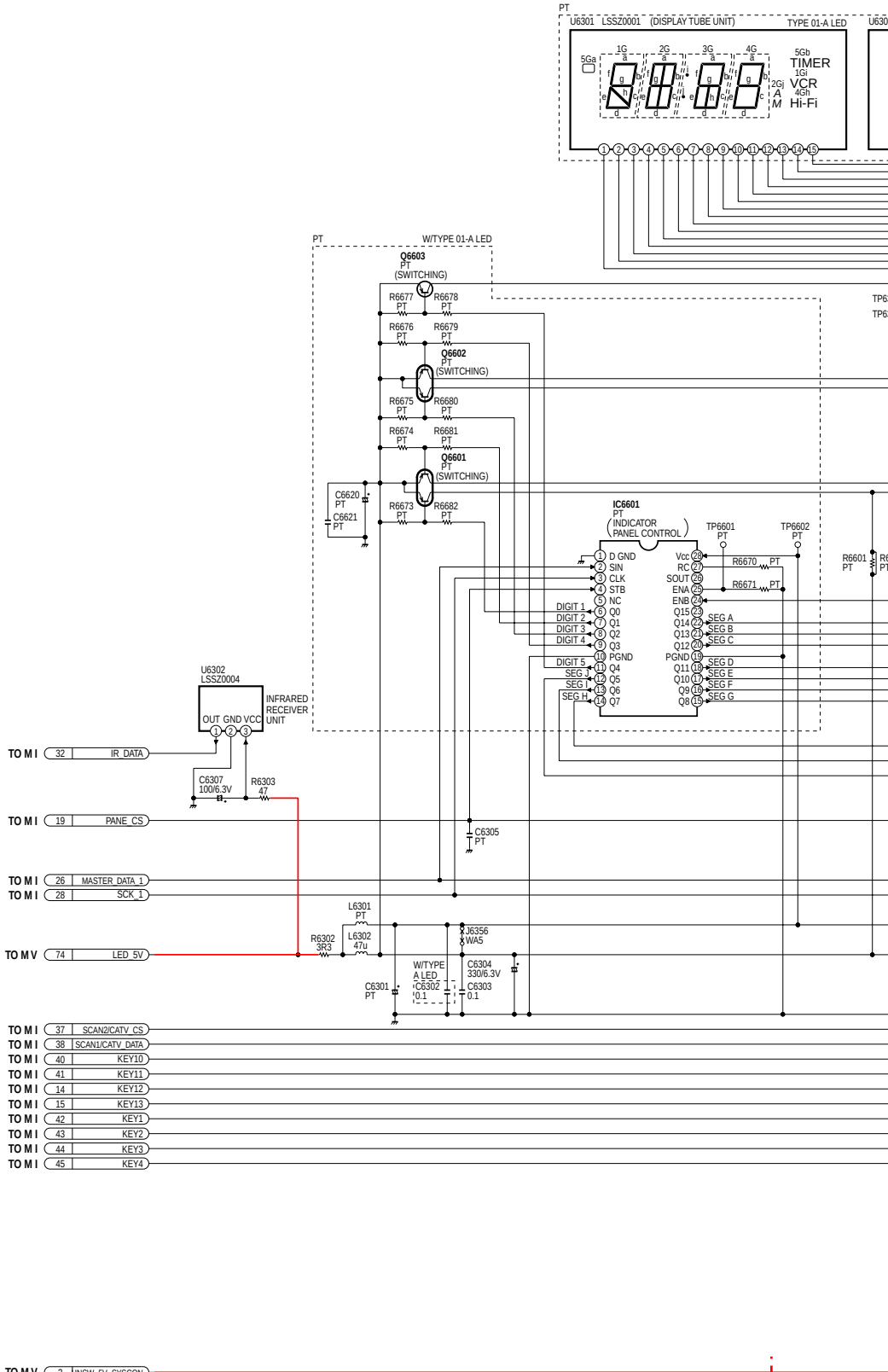


LSJB2006

PV-V4022-K/PV-V4522-K /PV-V462/PV-V4602 /PV-V4612S/PV-V4612-K/PV-V4622

MAIN II (SIGNAL PROCESS/ AUDIO) SCHEMATIC DIAGRAM

MAIN III (OPERATION) SCHEMATIC DIAGRAM

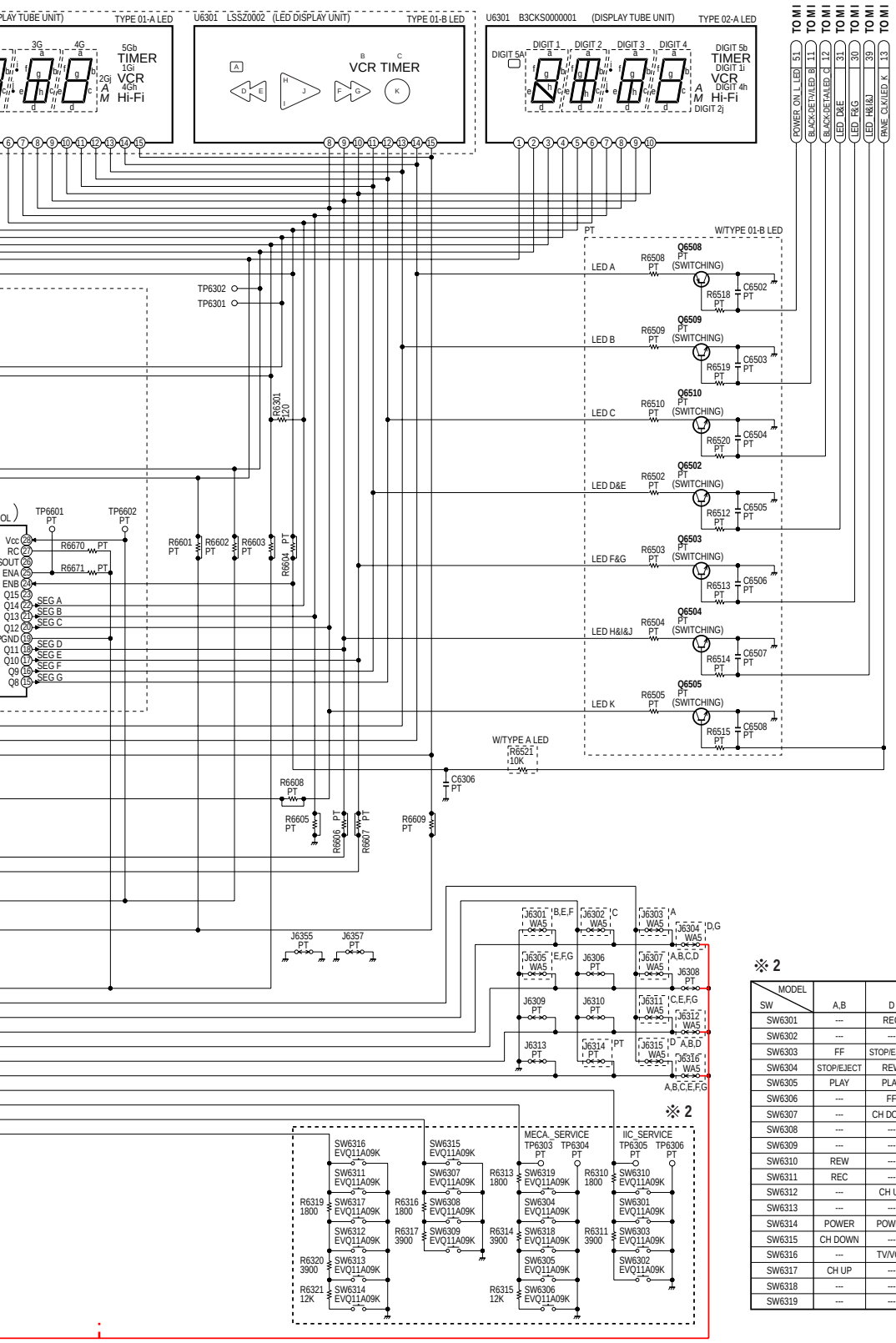


NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

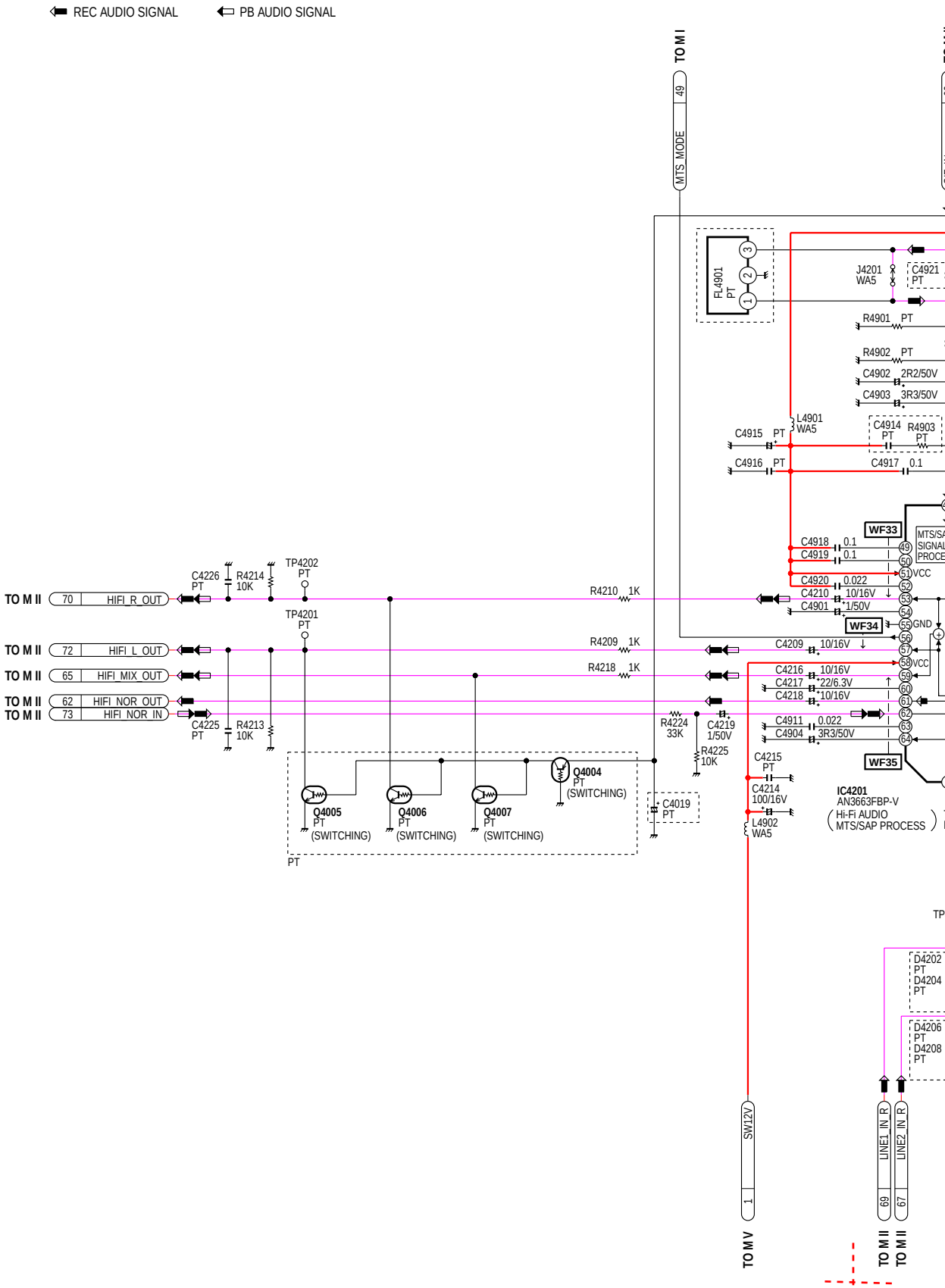


※2

SW \ MODEL	A,B	D	C,E,F,G
SW6301	---	REC	---
SW6302	---	---	---
SW6303	FF	STOP/EJECT	STOP/EJECT
SW6304	STOP/EJECT	REW	REW
SW6305	PLAY	PLAY	PLAY
SW6306	---	FF	FF
SW6307	---	CH DOWN	---
SW6308	---	---	---
SW6309	---	---	---
SW6310	REW	---	---
SW6311	REC	---	REC
SW6312	---	CH UP	---
SW6313	---	---	---
SW6314	POWER	POWER	POWER
SW6315	CH DOWN	---	CH DOWN
SW6316	---	TV/VCR	---
SW6317	CH UP	---	CH UP
SW6318	---	---	---
SW6319	---	---	---

LSJB2006
PV-V4022-K/PV-V4522-K/PV-V462
/PV-V4602/PV-V4612S/PV-V4612-K/PV-V4622
MAIN III (OPERATION) SCHEMATIC DIAGRAM

MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM (B,C,D,E,F,G)

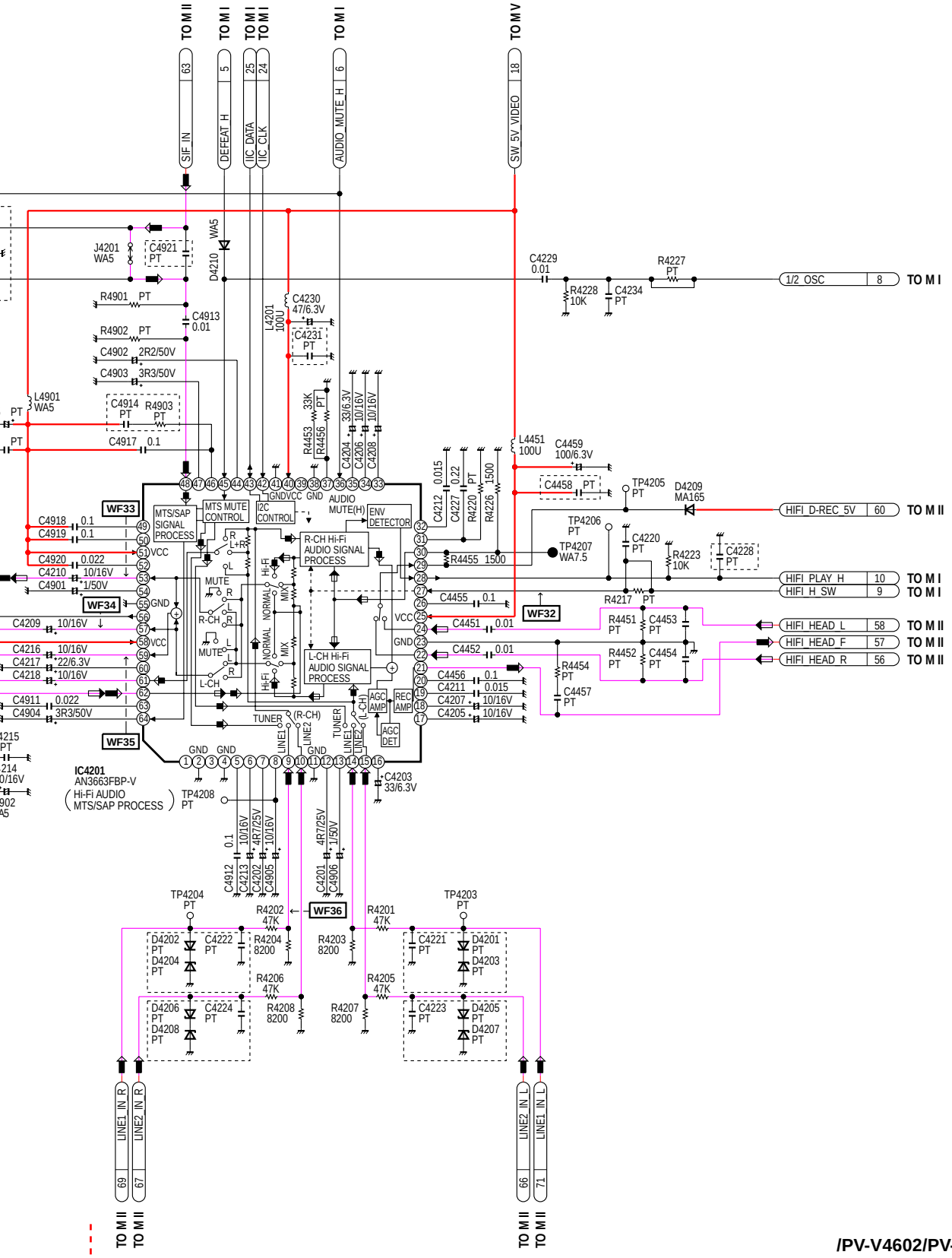


NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT



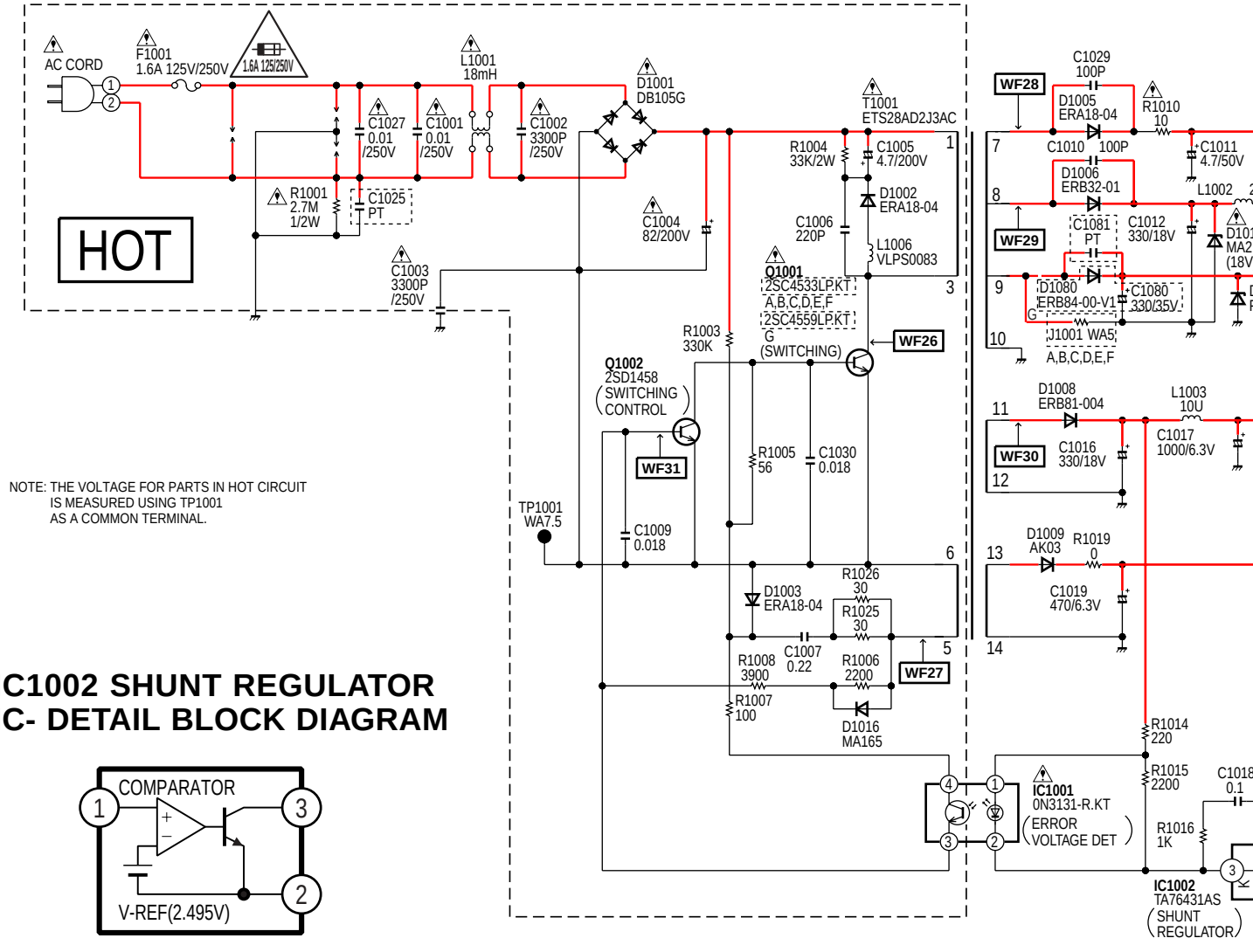
LSJB2006
PV-V4522-K/PV-V462
/PV-V4602/PV-V4612S/PV-V4612-K/PV-V4622
MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM

MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE 1.6A 125/250V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES
D'T INCENDIE N'I UTILISERQUE DES FUSIBLE DE MÉME
TYPE 1.6A 125/250V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,
USE ONLY THE SPECIFIED PARTS.

HOT CIRCUIT. BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.



NOTE: THE VOLTAGE FOR PARTS IN HOT CIRCUIT
IS MEASURED USING TP1001
AS A COMMON TERMINAL.

IC1002 SHUNT REGULATOR
IC- DETAIL BLOCK DIAGRAM

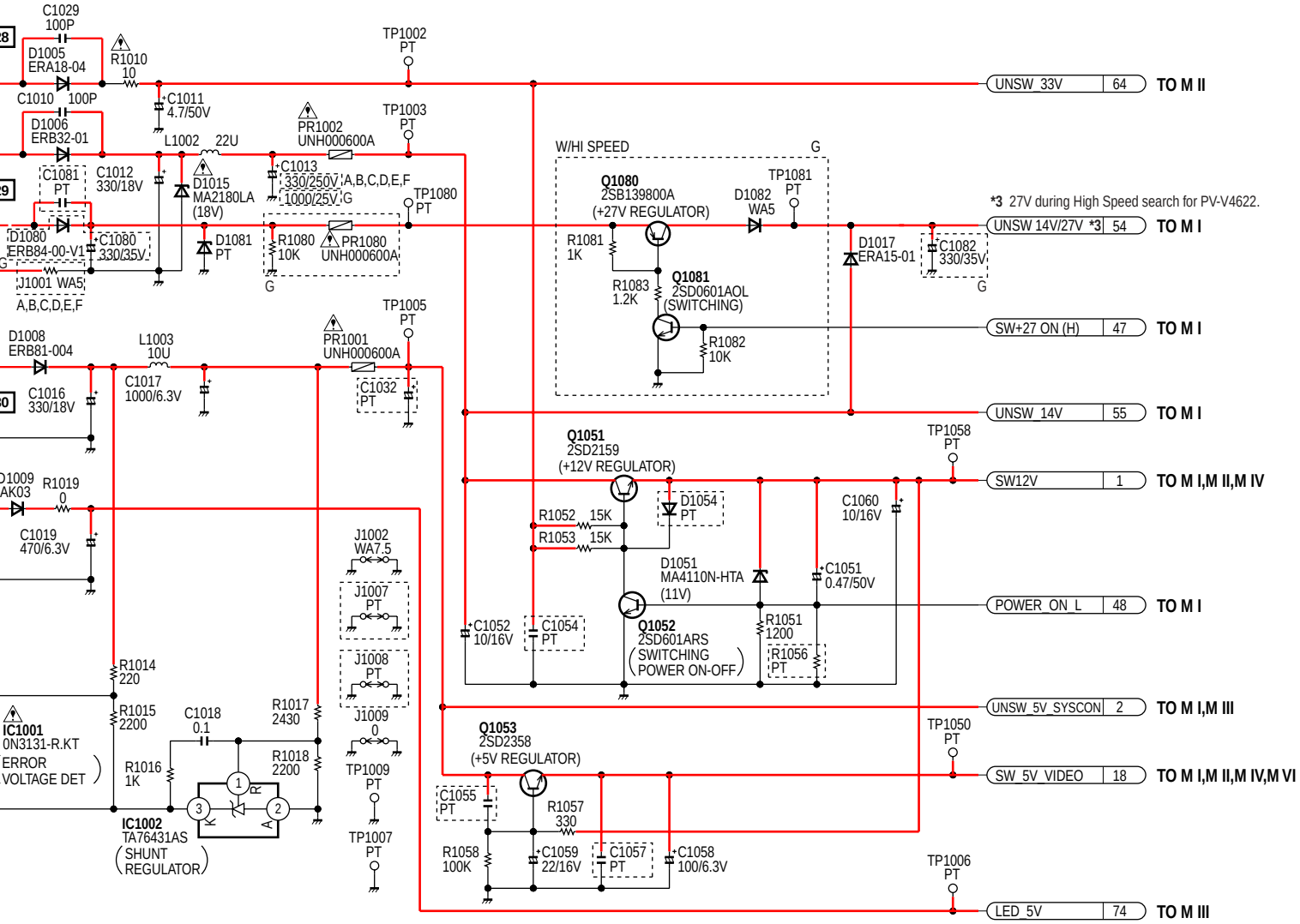
NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

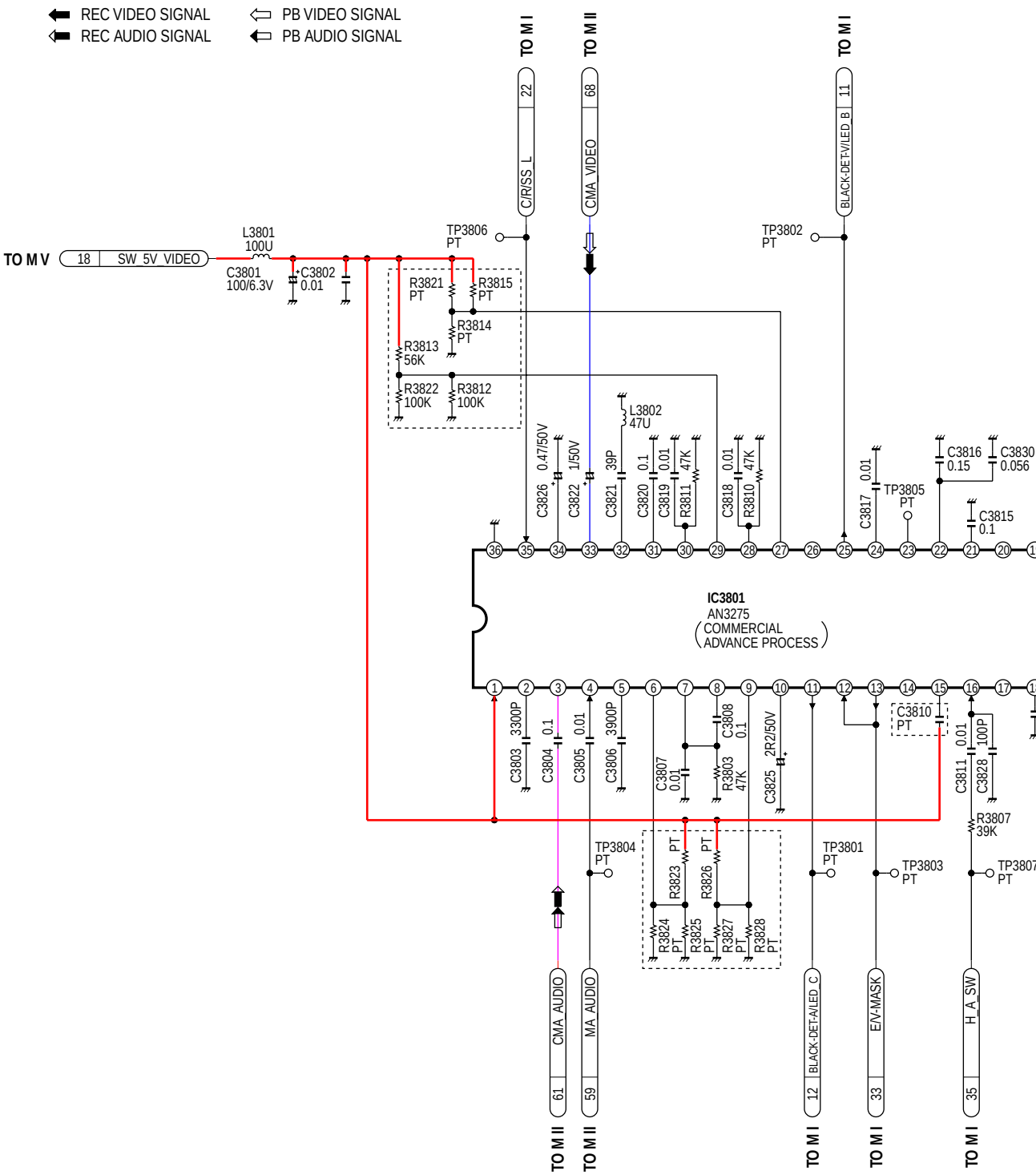
MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

E
FETY.
,



LSJB2006
PV-V4022-K/PV-V4522-K/PV-V462
/PV-V4602/PV-V4612S/PV-V4612-K/PV-V4622
MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

MAIN VI (ADVANCE) SCHEMATIC DIAGRAM (E,F,G)

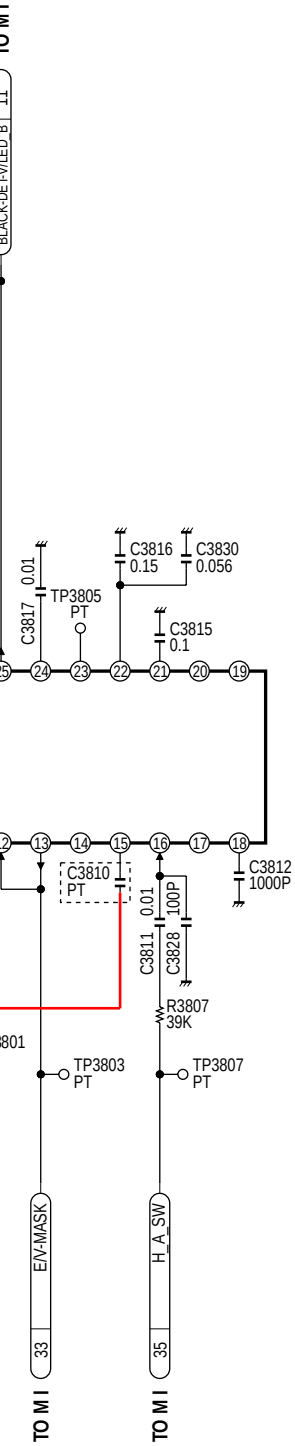


NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

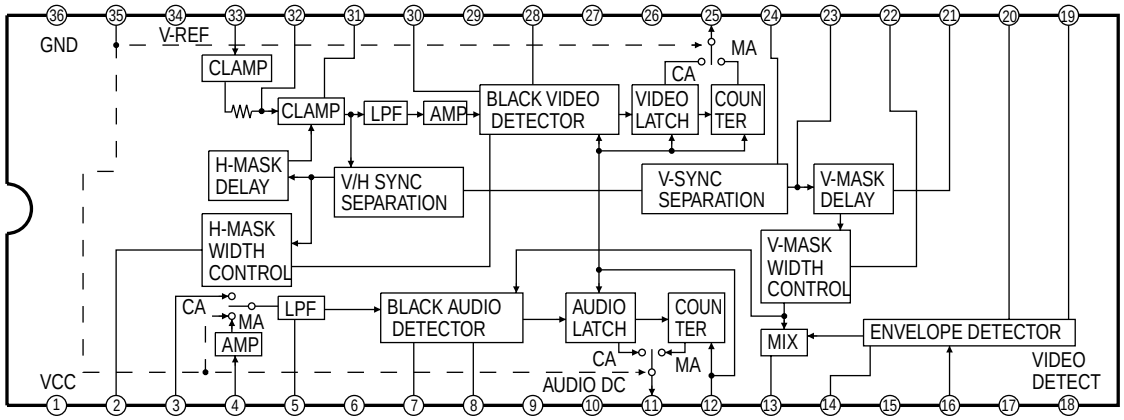
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

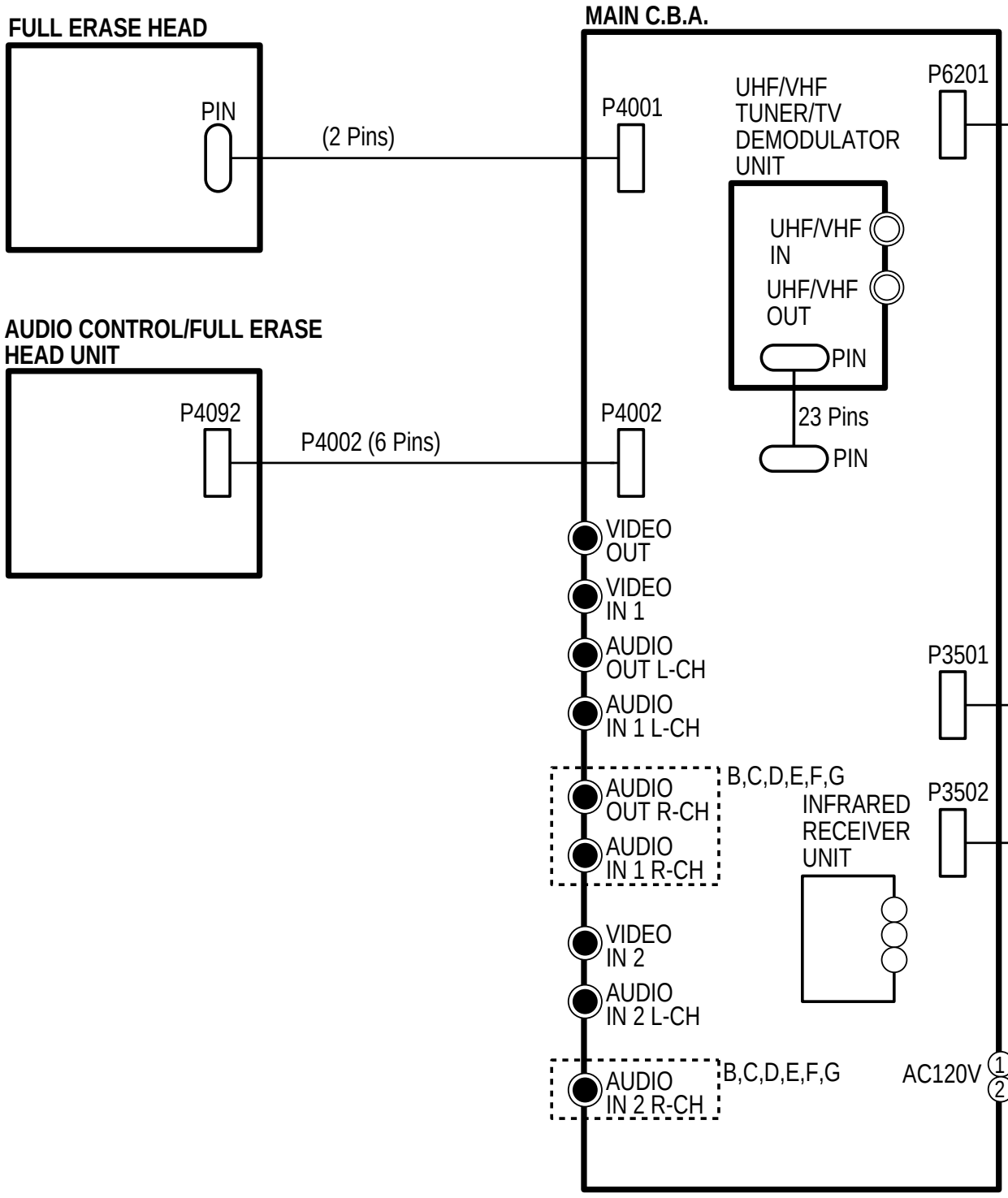


IC3801 COMMERCIAL ADVANCE PROCESS IC- DETAIL BLOCK DIAGRAM



7.3. INTERCONNECTION SCHEMATIC DIAGRAM

INTERCONNECTION SCHEMATIC DIAGRAM

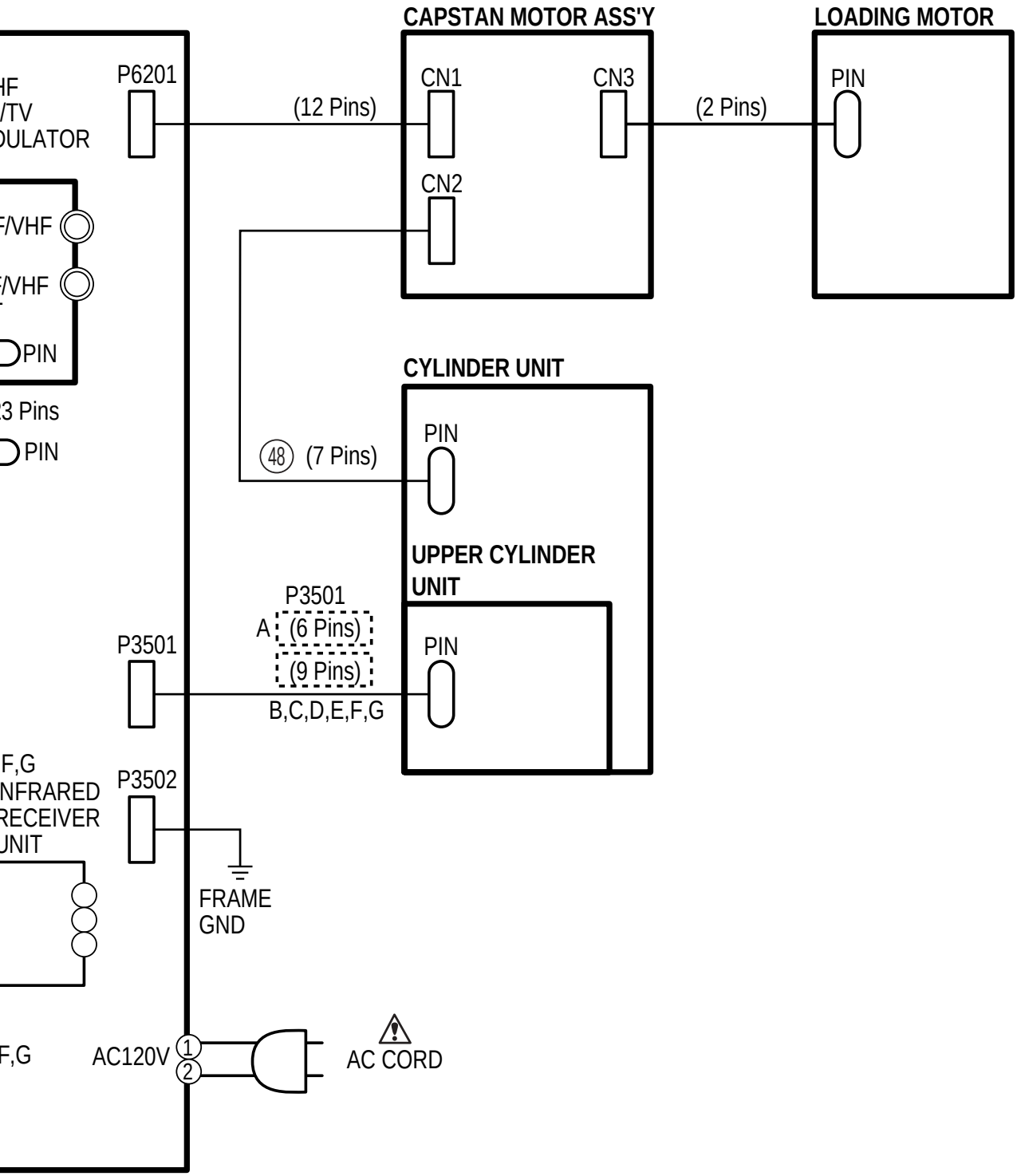


IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G
Not used	PT

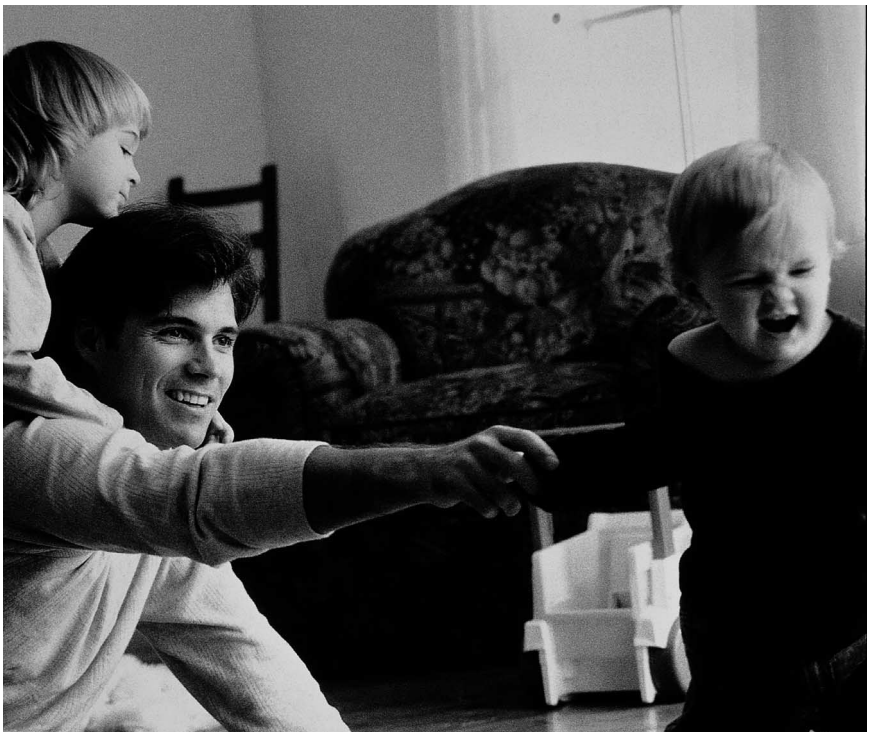


PV-V4022-K/PV-V4522-K/PV-V462 /PV-V4602/PV-V4612S/PV-V4612-K/PV-V4622 INTERCONNECTION SCHEMATIC DIAGRAM

Panasonic®

Omnivision VHS

Video Cassette Recorder
Operating Instructions
Model No. PV-V4622



Connections and Initial Setup Procedures are on pages 8 to 11.

VCR Plus+, ALLSET and PlusCode are trademarks of Gemstar Development Corporation. The VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

As an ENERGY STAR® Partner, Matsushita Electric Corporation of America has determined that this product or product model meets the ENERGY STAR® guidelines for energy efficiency.

Please read these instructions carefully before attempting to connect, operate or adjust this product. Please save this manual.

Spanish Quick Use Guide is included.
(Guía para rápida consulta en español está incluida.)

LSQT0509A

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

Important Safeguards and Precautions

FOR YOUR SAFETY, READ AND RETAIN ALL SAFETY AND OPERATING INSTRUCTIONS. HEED ALL WARNINGS IN THE MANUAL AND ON THE UNIT

INSTALLATION

1 POWER SOURCE CAUTION
Operate only from a power source indicated on the unit or in this manual. If necessary, have your Electric Utility Service Company or Video Products Dealer verify the power source in your home.

2 POLARIZED OR GROUNDING PLUG
As a safety feature, this Video product comes with either a polarized power cord plug (one blade is wider than the other), or a three-wire grounding type plug.

POLARIZED PLUG CAUTION:

This plug will only fit into an outlet one way. If you cannot fully insert the plug, try reversing it. If it still will not fit, have an electrician install the proper wall outlet. Do not defeat the safety feature by tampering with the plug.

GROUNDING PLUG CAUTION:

This plug will only fit into a three-hole grounding outlet. If necessary, have an electrician install the proper outlet. Do not defeat the safety feature by tampering with the plug.

3 POWER CORD
Make sure power cords are routed so that they are not likely to have anything rest on them, roll over them, or be in the way of walking traffic. If an extension cord is used, make sure it also has either a polarized or grounded plug and that the cords can be securely connected. Frayed cords, damaged plugs, and damaged or cracked wire insulation are hazardous and should be replaced by a qualified service technician. Overloaded outlets and extension cords are fire hazards and should be avoided.

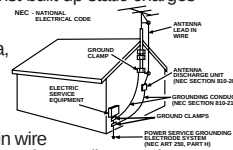
4 DO NOT BLOCK VENTILATION HOLES
Ventilation openings in the cabinet release heat generated during operation. If they are blocked, heat build-up inside the unit can cause failures that may result in a fire hazard or heat damage to cassettes. For protection, follow these rules:
a. Never cover ventilation slots or the unit while in use, or operate the unit when placed on a bed, sofa, rug, or other soft surface.
b. Avoid built-in installation, such as a book case or rack, unless proper ventilation is provided.

5 AVOID EXTREMELY HOT LOCATIONS OR SUDDEN TEMPERATURE CHANGES
Do not place the unit over or near any kind of heater or radiator, in direct sunlight, inside a closed vehicle, etc.. Do not move the unit suddenly between areas of extreme temperature variation. If the unit is suddenly moved from a cold place to a warm place, moisture may condense in the unit and on the tape.

6 TO AVOID PERSONAL INJURY
- Do not place unsecured equipment on a sloping surface.
- Do not place this unit on any support that is not firm, level, and adequately strong. The unit could fall causing serious injury to a child or adult and damage to the unit.
- An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
- Carefully follow all operating instructions and use the manufacturer's recommended accessories when operating this unit or connecting it to any other equipment.

OUTDOOR ANTENNA INSTALLATION

1 SAFE ANTENNA AND CABLE CONNECTION
If an outside antenna or cable system is connected to the equipment, be sure the antenna or cable system is grounded so as to provide some protection against built up static charges and voltage surges. Section 810 of the National Electrical Code, ANSI/NFPA 70 (in Canada, part 1 of the Canadian Electrical Code) provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements for the grounding electrode.


NEC - NATIONAL ELECTRICAL CODE
ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250, PART H)

2 KEEP ANTENNA CLEAR OF HIGH VOLTAGE POWER LINES OR CIRCUITS
An outside antenna system should be located well away from power lines, electric light or power circuits and where it will never come into contact with these power sources if it should happen to fall. When installing an outside antenna, extreme care should be taken to avoid touching power lines, circuits or other power sources as this could be fatal. Because of the hazards involved, antenna installation should be left to a professional.

USING THE VIDEO UNIT

If the unit has been in storage or moved to a new location, refer first to the INSTALLATION section of these safeguards.

1 KEEP THIS VIDEO UNIT AWAY FROM WATER OR MOISTURE OF ANY KIND.

2 IF EQUIPMENT IS EXPOSED TO RAIN, MOISTURE, OR STRONG IMPACT, unplug the unit and have it inspected by a qualified service technician before use.

3 DURING AN ELECTRICAL STORM
During a lightning storm, whether indoors or outdoors, or before leaving the unit unused for extended periods of time, disconnect all equipment from the power source as well as the antenna and cable system.

4 WHEN THE UNIT IS PLUGGED IN
- Never expose the unit to rain or water. DO NOT OPERATE if liquid has been spilled into the unit. Immediately unplug the unit, and have it inspected by a service technician. Fire and shock hazards can result from electrical shorts caused by liquid contact inside.
- Never drop or push any object through openings in the unit. Some internal parts carry hazardous voltages and contact can cause electric shock or fire hazard.
- Avoid placing the unit directly above or below your TV set as this may cause electrical interference. Keep all magnets away from electronic equipment.

5 USING ACCESSORIES
Use only accessories recommended by the manufacturer to avoid risk of fire, shock, or other hazards.

6 CLEANING THE UNIT
Unplug the unit. Then, use a clean, dry, chemically untreated cloth to gently remove dust or debris. DO NOT USE cleaning fluids, aerosols, or forced air that could over-spray, or seep into the unit and cause electrical shock. Any substance such as wax, adhesive tape, etc. may mar the cabinet surface. Exposure to greasy, humid, or dusty areas may adversely affect internal parts.

SERVICE

1 DO NOT SERVICE THIS PRODUCT YOURSELF
If, after carefully following the detailed operating instructions, this Video product does not operate properly, do not attempt to open or remove covers, or make any adjustments not described in the manual. Unplug the unit and contact a qualified service technician.

2 IF REPLACEMENT PARTS ARE REQUIRED
Make sure the service technician uses only parts specified by the manufacturer, or those having the same safety characteristics as the original parts. The use of unauthorized substitutes may result in fire, electric shock, or other hazards.

3 HAVE THE SERVICE TECHNICIAN PERFORM A SAFETY CHECK
After any service or repairs to the unit, request the service technician to conduct a thorough safety check as described in the manufacture's service literature to ensure that the video unit is in safe operating condition.

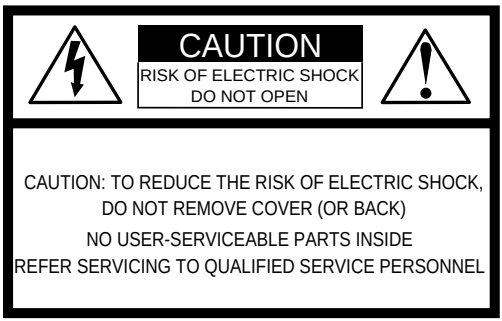
Safety Precautions

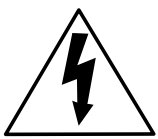
WARNING: To prevent fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION: To prevent electric shock, match wide blade of plug to wide slot, fully insert.

Avertissement: Afin de prévenir tout risque d'incendie ou de chocs électriques, ne pas exposer cet appareil à la pluie ou à une humidité excessive.

Attention: Pour éviter les chocs électriques, introduire la lame la plus large de la fiche dans la borne correspondante de la prise et pousser jusqu'au fond.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL



This symbol warns the user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.

This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.

Note to CABLE system installer:
This reminder is provided to call the CABLE system installer's attention to Article 820-40 of the NEC in USA (and to the Canadian Electrical Code in Canada) that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

FCC Warning: Any unauthorized changes or modifications to this equipment would void the user's authority to operate.

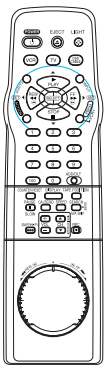
Congratulations

on your purchase of one of the most sophisticated and reliable products on the market today. Used properly, it will bring you years of enjoyment. Please fill in the information below. The serial number is on the tag located on the back of your VCR.

- Date of Purchase _____
- Dealer Purchased From _____
- Dealer Address _____
- Dealer Phone No. _____
- Model No. **PV-V4622**
- Serial No. _____

Accessories

☐ Remote Control
LSSQ0314

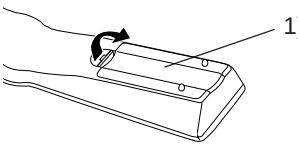


☐ Batteries 2 “AA”

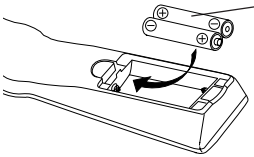
☐ RF Coaxial Cable
VJAS0196

To order accessories, call toll free 1-800-332-5368.

Loading the Batteries



1) Open cover.



2) Insert batteries as marked.

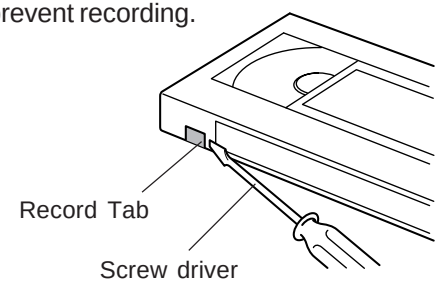
3) Close cover.

☐ **Battery replacement caution**

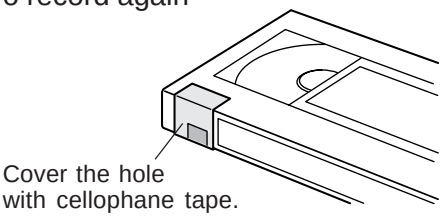
- Do not mix old and new batteries.
- Do not mix alkaline with manganese batteries.

Prevent Accidental Tape Erasure

Break off the tab to prevent recording.



To record again



Record/ Playback Time

Only use tapes with the VHS mark in this unit.

Tape Speed Setting	Type of Video Cassette		
	T60	T120	T160
SP (Standard Play)	1 Hour	2 Hours	2 Hours 40 Minutes
LP (Long Play)	2 Hours	4 Hours	5 Hours 20 Minutes
SLP (Super Long Play)	3 Hours	6 Hours	8 Hours

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

Table of Contents

Important Safeguards and Precautions **2, 3**
Accessories **4**
Loading the Batteries **4**
Prevent Accidental Tape Erasure **4**
Record/ Playback Time **4**
Location of Controls **6, 7**
Initial Setup for ANT./ Cable-VCR-TV Connection **8, 9**
Initial Setup for DSS/ Cable Box-VCR-TV Connection ... **10, 11**

Reset Language, Channels, Clock, VCR's Output Channel ... **12, 13**
Playback a Tape **14**
Record on a Tape **15**

Timer Recording **16, 17**
Timer Recording Using VCR Plus+® System ..... **18 ~ 21**

Multi-Brand Control Feature **22, 23**
Advanced Connections (Cable/DSS) **24**
MTS Broadcast/ VHS Hi-Fi Stereo System **25**
Tape Operation (COMMERCIAL ADVANCE® and MOVIE ADVANCE®) .. **26 ~ 31**
Special VCR Features ..... **32 ~ 35**
Copying Your Tapes (Dubbing) **36**

VCR & Cassette Information **37**
On-Screen Displays (OSD) **38**
Before Requesting Service **39**
Limited Warranty **40, 41**
Spanish (Español) Quick Use Guide **42, 43**
Index ..... **Back Cover**

Location of Controls

Remote control Buttons

EJECT
(Ejects tape)

POWER
(Turns VCR off/on)

VCR (mode)
(Enables VCR functions)

VCR/TV
(For TV or VCR mode)

PLAY (Plays a tape)/
FAST FORWARD/SEARCH
(Fast forwards tape/ forward visual search)
REWIND/SEARCH
(Rewinds tape/ reverse visual search)
STOP (Stops tape)

▲▼◀ ▶ Remote keys
PLAY, STOP, REW, and FF function as ▲▼◀ ▶ operation keys when menus are displayed.

ACTION
(Displays menu)

COUNTER RESET
(Resets counter to zero)

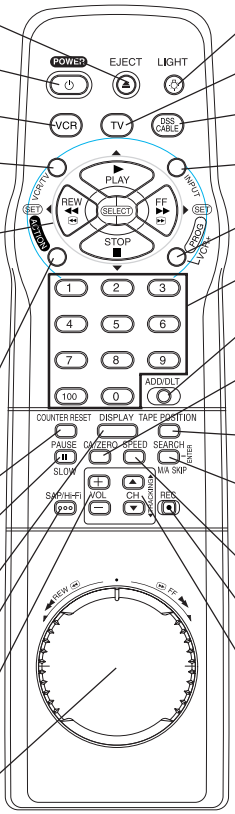
PAUSE/SLOW
(Displays still, frame by frame, or slow motion picture)

DISPLAY
(Displays VCR status)

SAP/Hi-Fi
(Selects audio mode for play or record)

VOLUME +/–
(Adjusts TV volume)

SHUTTLE Ring
(Variable speed search)



LIGHT
(Remote buttons light up)

TV (mode)
(Enables TV functions)

DSS/CABLE mode
(Enables DSS/CABLE functions)

INPUT
(For LINE or channel)

PROGRAM/VCR+
(Displays Timer Program screen)

NUMBER Keys
(Selects channel directly)

ADD/DELETE
(Adds or deletes a channel)

COMMERCIAL ADVANCE/ ZERO SEARCH
(Set MOVIE ADVANCE/ Zero search)

TAPE POSITION
(Locates tape position)

SEARCH/ ENTER
(Set search system /Tunes TV channel)

MOVIE ADVANCE
(Set MOVIE ADVANCE)

SPEED
(Changes tape speed)

RECORD
(Records a program, etc.)

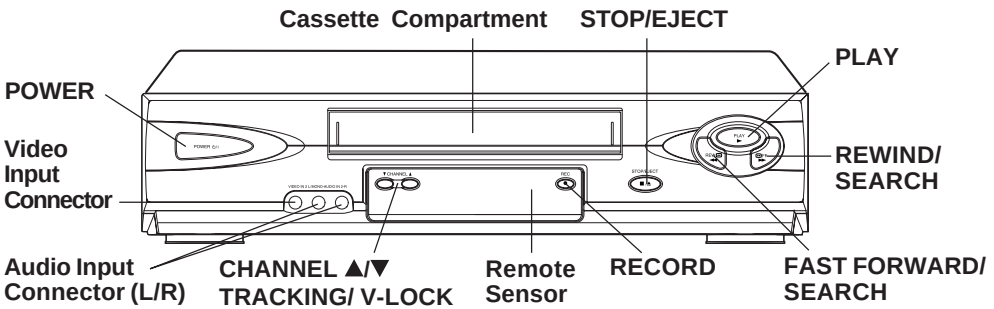
CHANNEL ▲/▼ TRACKING/ V-LOCK
(Selects channel/ reduces picture noise during Play and Slow mode)

Light Tower Universal shuttle Remote Control

LIGHT button: When pressed, available buttons light and selected mode button (TV, VCR, or DSS CABLE) flashes 5 seconds. If no button is pressed, light goes out in 5 seconds. Also, hold down a button to confirm the selected mode (mode button flashes) in the dark.

EJECT button: Press to eject tape. EJECT is not available during record.

Front View of the VCR



Multi Function Display

Timer Indicator
Lights up when the VCR is set for Timer Recording, or when One Touch Recording (OTR) is used. Flashes when a Timer Recording is set, but tape has not been inserted into the VCR

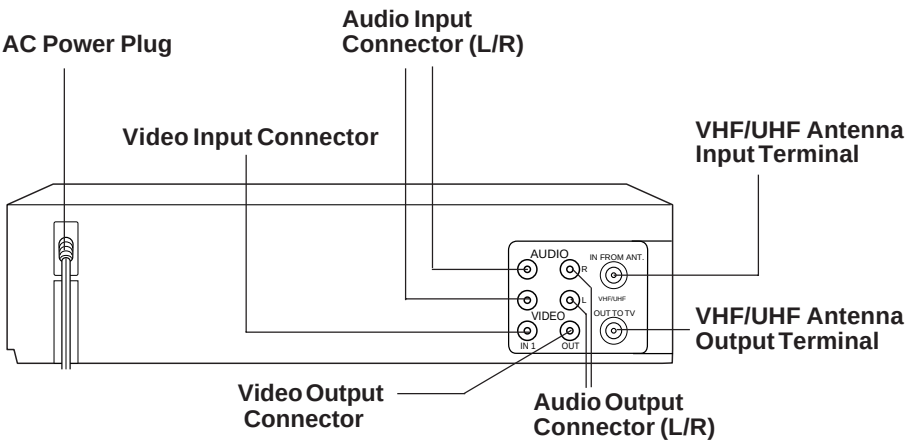
Power Indicator
Lights up when power is on.

VCR Indicator
Lights up when the VCR/TV selector is set to VCR.

Clock/ Status/ Channel/ Speed Display
Displays the current time. Briefly displays VCR status when a function button is pressed. Briefly displays the channel number, or “L1” or “L2” when a channel or line input is selected. Briefly displays the recording speed when SPEED is pressed.

Hi-Fi Indicator
Lights up when Hi-Fi audio is monitored in Playback Mode.

Rear View of the VCR



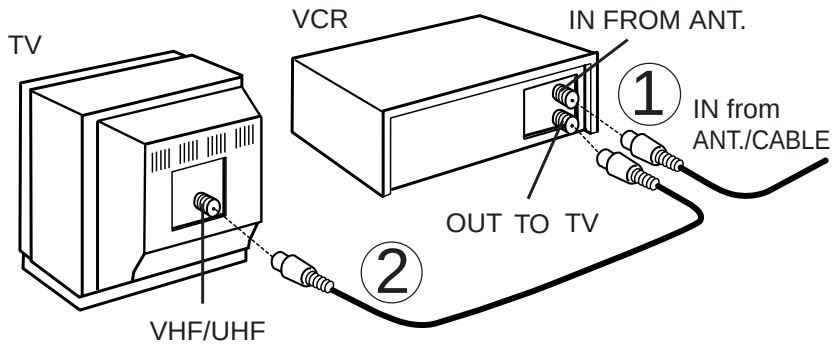
Initial Setup for ANT./Cable - VCR - TV Connection

Please make all cable or antenna connections before plugging into the AC outlet.
Plugging the VCR Power Cord into an AC wall outlet starts auto channel and clock set.

How to Connect

① **Connect cable from Antenna/Cable to VCR's IN FROM ANT. jack.**

② **Connect VCR's OUT TO TV jack to TV's ANT. IN jack with included RF Cable accessory.**



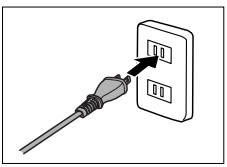
Doing Initial Setup (Ready to Play)

1 **Turn TV on and tune to channel 3.**

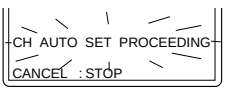
2 **Plug VCR Power Cord into AC wall outlet. VCR comes on and auto channel and clock set starts.**

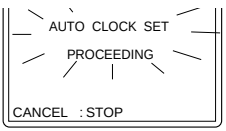
- If screen right does not appear, check VCR - TV connection and, if TV is tuned to channel 3, try switching it to channel 4.
- To change VCR's output channel, please refer to "VCR's Output Channel" on page 13.

WARNING
When using "Nut type" RF coaxial cables, tighten with fingers only. Overtightening may damage terminals.



Plugging the AC Power Plug into an AC outlet

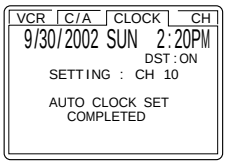




For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

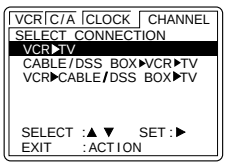
*__Important:__ If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

3 **Settings are made automatically. When setup is done, this screen appears.**

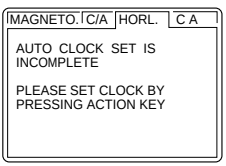


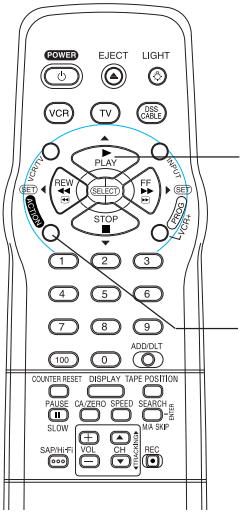
4 **SELECT CONNECTION screen is displayed.**

Press ▲▼* to select connection "VCR ▶ TV" or "VCR ▶ CABLE/DSS BOX ▶ TV", and press ▶ to set.



If "AUTO CLOCK SET IS INCOMPLETE" appears, manually set clock. See below right.

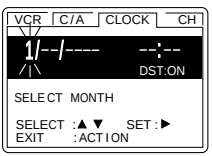




Manual Clock Set

If Auto Clock Set was incomplete.

a **Press ACTION** on remote to display CLOCK screen.



b **Press ▲▼** to select the month and **▶** to set. In the same manner, select and set the date, year, time, and DST (daylight saving time).

c **Press ACTION** to start clock, and go to step 4 above left.

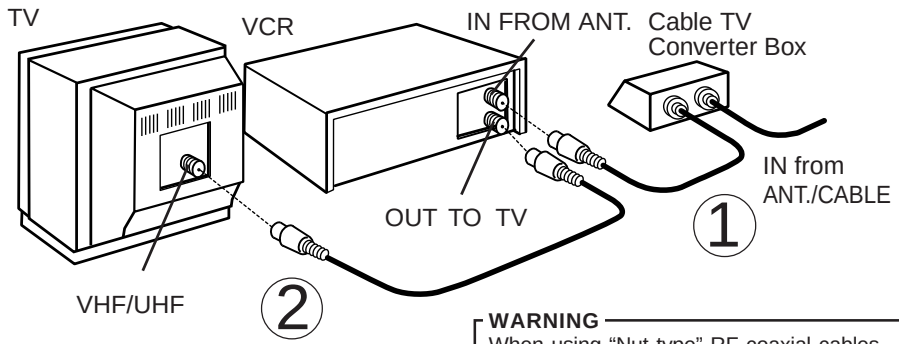
Initial Setup for DSS/Cable Box - VCR - TV Connection

Please make all cable or antenna connections before plugging into the AC outlet.
Plugging the VCR Power Cord into an AC wall outlet starts auto channel and clock set.

How to Connect

1 **Connect the OUT Jack on your cable box to the IN FROM ANT. terminal on the VCR with the RF Cable.**

2 **Connect the OUT TO TV terminal on the rear of VCR to the ANT. IN terminal on TV using the RF Cable (included accessory).**



WARNING
When using "Nut type" RF coaxial cables, tighten with fingers only. Overtightening may damage terminals.

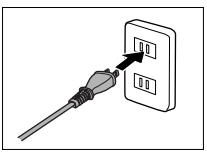
Doing Initial Setup (Ready to Play)

1 Turn TV on and tune to channel 3.

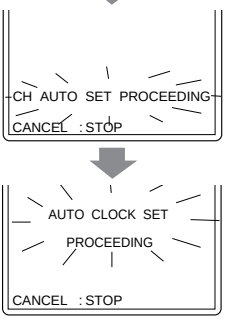
- Turn on your cable box and set it to your Public Broadcasting Station (PBS) channel in your time zone. If you use a DSS receiver, it must be turned off.

2 Plug VCR Power Cord into AC wall outlet. VCR comes on and auto channel and clock set starts.

- If screen right does not appear, check VCR - TV connection and, if TV is tuned to channel 3, try switching it to channel 4.
- To change VCR's output channel, please refer to "VCR's Output Channel" on page 13.



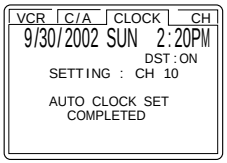
Plugging the AC Power Plug into an AC outlet



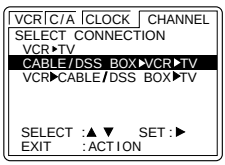
For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

*__Important:__ If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

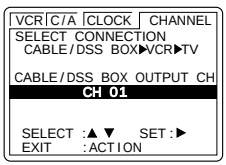
3 **Settings are made automatically. When setup is done, this screen appears.**



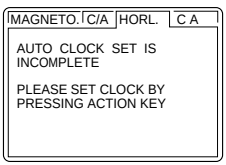
4 **SELECT CONNECTION screen is displayed.**
Press ▲▼* to select connection "CABLE/ DSS BOX ▶ VCR ▶ TV" and press ▶ to set.

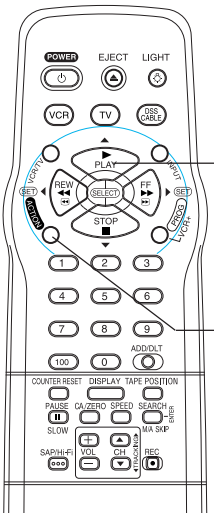


Confirm the output channel of your cable box or DSS receiver. Press ▲▼ to select the same channel as the cable box or DSS receiver output channel. Press ▶ to enter.



If "AUTO CLOCK SET IS INCOMPLETE" appears, manually set clock. See right.

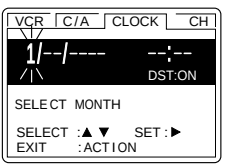




Manual Clock Set

If Auto Clock Set was incomplete.

a **Press ACTION** on remote to display CLOCK screen.

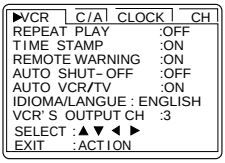


b **Press ▲▼** to select the month and **▶** to set. In the same manner, select and set the date, year, time, and DST (daylight saving time).

c **Press ACTION** to start clock, and go to step 4 above left.

Reset Language, Channels, Clock,

1

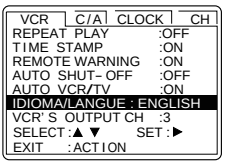


Press ACTION* to display menu.

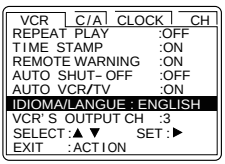
2

■ Language

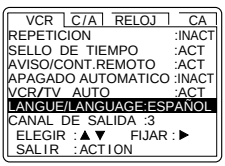
1) **Press ▲▼** to select language item.



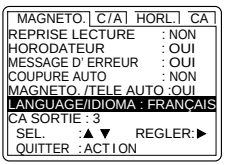
2) **Press ▶** repeatedly.



For English



For Spanish

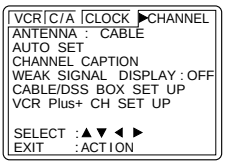


For French

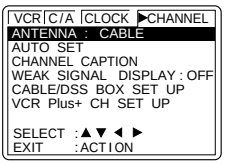
3) **Press ACTION** to exit.

■ Channels

1) **Press ◀▶** to select CHANNEL.

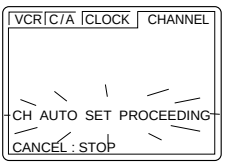


2) **Press ▲▼** to select "ANTENNA," then **press ▶** to set your antenna system ("TV" or "CABLE").



3) **Press ▲▼** to select "AUTO SET," then **press ▶**.

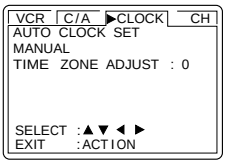
- If you use Cable Box, set it to the PBS channel in your time zone.



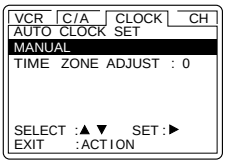
- After Channel Auto Set is finished, Auto Clock Set will be performed.

■ Clock

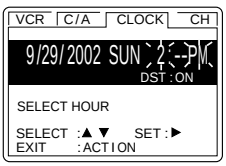
1) **Press ◀▶** to select CLOCK.



2) **Press ▲▼** to select "MANUAL," and **press ▶**. (For Auto Clock Set, select "AUTO CLOCK SET.")



("TIME ZONE ADJUST" appears only when auto clock is set.)



3) **Press ▲▼** and **◀▶** to select and set the date, time, and DST (Daylight Saving Time).

4) **Press ACTION** to start the clock and exit this mode.

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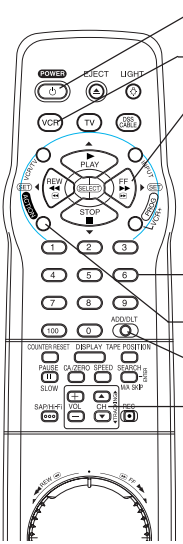
VCR's Output Channel

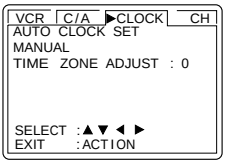
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.



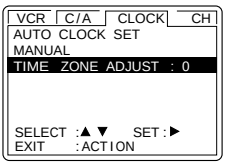
■Time Zone Adjust

(Only when Auto Clock is set.)

1) **Press ◀ ▶** to select CLOCK.



2) **Press ▲▼** to select "TIME ZONE ADJUST."



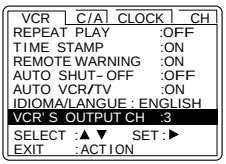
and **press ▶** to subtract or add hour(s) as necessary.

3) **Press ACTION**.

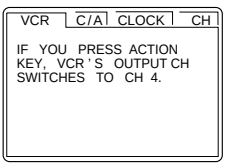
- "TIME ZONE ADJUST" returns to "0" if clock is set manually.

■ VCR's Output Channel

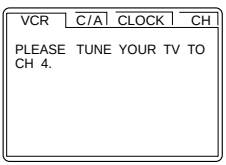
1) **Press ▲▼** to select VCR'S OUTPUT CH.



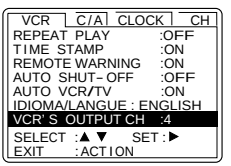
2) **Press ▶**.



3) **Press ACTION**.



After 3 seconds

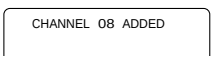


- To Make Corrections, repeat steps 1) ~ 3).

Add or Delete a Channel

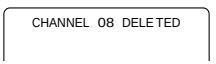
To add channel:

Select channel with **NUMBER keys** and **press ADD/DLT**.



To delete channel:

Select channel with **CH ▲/▼** or **NUMBER keys** and **press ADD/DLT**.



DST (Daylight Saving Time)

VCR auto adjusts clock for DST. (p. 9.)

Spring (First Sunday in April)
DST:ON ➔ Sets clock ahead one hour.

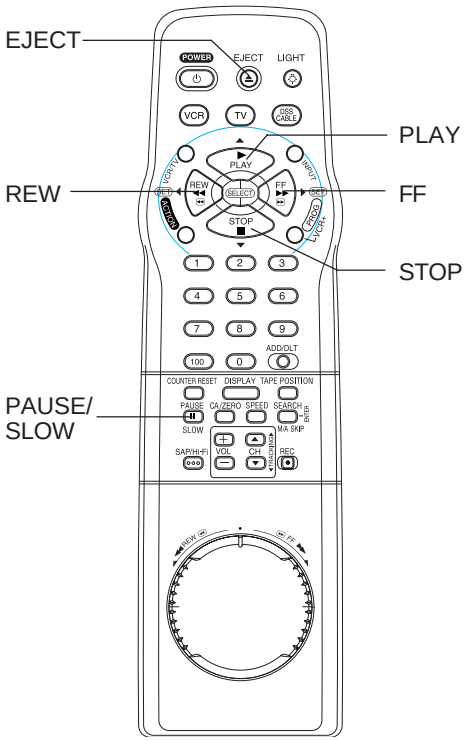
Autumn (Last Sunday in October)
DST:ON ➔ Turns clock back one hour.

- If your area does not observe Daylight Saving Time, select DST:OFF.
- Keep these time changes in mind when programming VCR for timer recordings.

Playback a Tape

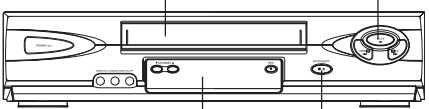
Ready Checklist

- ☐ All connections are made (p. 8, 10, 24).
- ☐ TV and VCR are plugged in.
- ☐ TV is on and tuned to CH3, 4, or VIDEO.
- ☐ **Remote is in VCR mode. (Press VCR)**



Playback using VCR controls

1 Insert a tape. 2 Press PLAY.

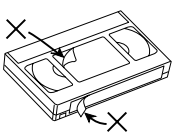


Multi Function Display

■ Press STOP/EJECT to stop and/ or eject tape.

Note

Remove loose or peeling labels from tapes to prevent tape jam.



1 Insert a tape,

- **VCR power comes on. "VCR" lights on Multi Function Display. If Auto VCR/TV (p. 35) is set to "OFF," press VCR/TV until "VCR" lights on the Multi Function Display.**

2 Press PLAY to play tape.

- If tape has no rec. tab (p. 4), auto play begins.

Special Features During Play

■ **Forward/ Reverse scene search**
- ➛ **Press FF** or **REW**.
- ➛ **Press PLAY** to release.

After search has begun, each additional press of **FF** or **REW** changes speed as shown below.

[SLP] : Approx. 21X ↔ Approx. 43X
[LP] : Approx. 9X ↔ Approx. 15X
[SP] : Approx. 7X ↔ Approx. 13X

- If picture is interrupted at 43X, 15X, or 13X speed, speed changes to 21X, 9X, or 7X.
- It may take a moment for 43X, 15X, or 13X search to start while tape condition is being determined.
- 43X, 15X, or 13X search may not be possible with some tapes.

Notes

- Picture interruption may occur with some TVs.
- FF and REW search speed may vary depending on current tape position.

■ **Still (Freeze) picture**
- ➛ **Press PAUSE/SLOW**.
- ➛ **Press PLAY** to release.

■ **Frame by Frame picture**
- ➛ **Press PAUSE/SLOW** in Still mode.
- ➛ **Press PLAY** to release.

■ **Slow Motion picture**
- ➛ **Hold down PAUSE/SLOW** in Still mode.
- ➛ **Press PLAY** to release.

Notes

- These features work best in SP or SLP mode.
- The sound will be muted.
- To reduce picture noise, see "Manual Tracking Control" on page 37.
- After the VCR is in Still or Slow mode for 3 minutes, it will switch to Stop mode automatically to protect the tape and the video head.

3 Press STOP to stop tape.

■ **Rapid Rewind/ Fast Forward**
(E.g., T-120 tape rewinds in approx. 1 minute.)
Press REW or **FF** in Stop mode.

Notes

- Rewind or FF starts after VCR detects tape length. This may take a moment.
- Rew/ FF speed slows down at start and end portions of the tape.

■ **Press EJECT on remote, or STOP/EJECT on VCR** to eject tape.

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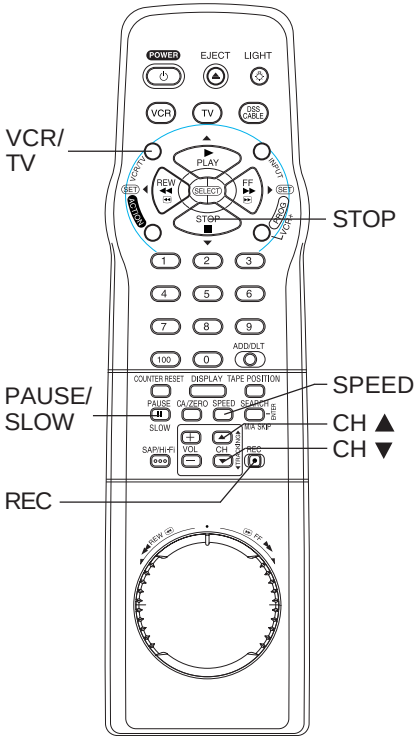
Record on a Tape

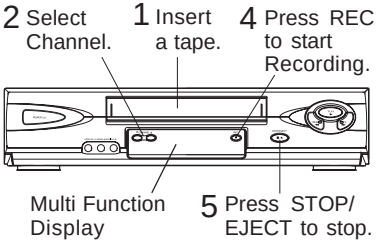
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Ready Checklist

- ☐ All connections are made (p. 8, 10, 24).
- ☐ TV and VCR are plugged in.
- ☐ TV is on and tuned to CH3, 4, or VIDEO.
- ☐ **Remote is in VCR mode. (Press VCR)**



Record using VCR controls



This video recorder, equipped with HQ (High Quality) system, is compatible with existing VHS equipment. Only use tapes with the VHS mark. Only tapes tested and inspected for use in 2, 4, 6, and 8 hour machines are recommended.

1 **Insert a tape with a record tab** (p. 4).

- **VCR power comes on. "VCR" lights on Multi Function Display. If Auto VCR/TV (p. 35) is set to "OFF," press VCR/TV until "VCR" lights on the Multi Function Display.**

2 **Press CH ▲▼* or NUMBER keys** to select the channel.

- For "LINE" input, see p. 36.
- For channel over 100, first press 100 key then the other 2 digits.

3 **Press SPEED** to select the record speed (p. 4).

SP = Standard Play **LP** = Long Play
SLP = Super Long Play

- Speed appears on-screen and on Multi Function Display.

4 **Press REC** to start recording.

- To edit, press PAUSE/SLOW to pause, and again to resume recording.

5 **Press STOP** to stop recording.

■ **One Touch Recording** (recording in progress),

- VCR shuts off after the preset record length.

➛ each press of REC adds 30 min. to the record length up to 4 hours.

■ **Record one station, watch another,**

➛ press VCR/TV ("VCR" goes out on Multi Function Display),

➛ select channels at TV (recording continues).

Note

- **Watching one channel and recording another is NOT possible when using a Cable Box or a Satellite Receiver.**

■ **Select channels at VCR,**

- Other channels cannot be viewed during recording.

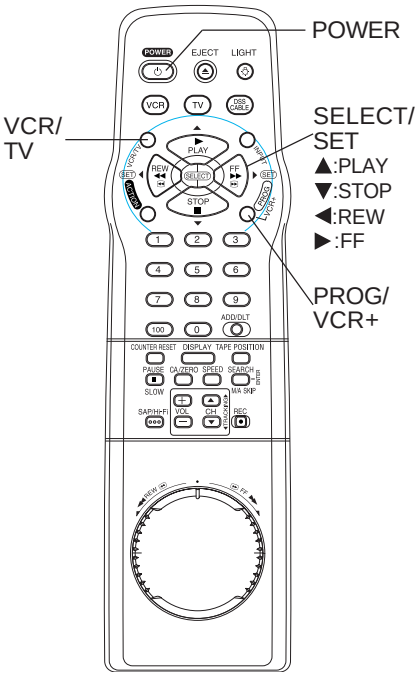
➛ press VCR/TV ("VCR" lights up on Multi Function Display),

➛ select channels at VCR.

Note

- After 5 min. in Pause mode, VCR stops to protect the tape and the video head.

Timer Recording

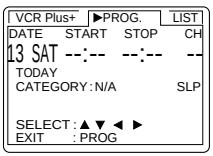


Ready Checklist

- ☐ All connections are made (p. 8, 10, 24).
- ☐ TV and VCR plugged in and turned on.
- ☐ VCR/TV selector set to "VCR."
- ☐ Clock set correctly.
- ☐ Tape has rec. tab (p. 4).
- ☐ **Remote is in VCR mode. (Press VCR)**

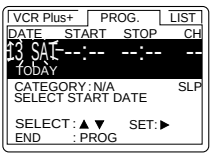
1 **Press PROG/VCR+*** button to display PROGRAM.

2



Press ▼ to display Program screen.

3



1) Set record DATE, press ▲▼ to select: 1~31= one time, or DAILY= MON~ FRI, or WEEKLY= same time each week and **press ▶** to set.

- See selection order below left.

Example

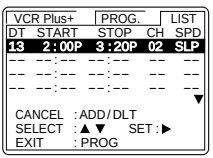
Today — 13 → 14 — 15 ···· 31 — 1 — 2 ····· 12 → DAILY → WEEKLY (SAT) ..... WEEKLY (MON) — WEEKLY (SUN) → 13

SELECT▲/▼ Selection Order

2) To set remaining items, press ▲▼ to select and **press ▶** to set START/ STOP times, CH (channel) or LINE input (p. 36), Category** and tape speed (SP, LP, SLP).

Press PROG/VCR+ button to end the program.

4



To Enter More Programs, press ▲▼ to select and **press ▶** to set an unused program number and repeat step 3.

Or

Press PROG/VCR+ button **again** to exit.

5 **Press POWER off** to set the Timer Recording. ("TIMER" lights up on Multi Function Display.)

Notes

- **If you are using a Cable Box, VCR Timer Programming Channel (Step 3) must be set to the Cable Box output channel AND your Cable Box must be manually set to the desired channel. The Cable Box must be left on.**
- **If a power interruption occurs while programming the timer, the timer program(s) may be canceled. If "TIMER PROGRAMS WERE LOST DUE TO POWER INTERRUPTION" appears on-screen, please reenter the timer programs.**

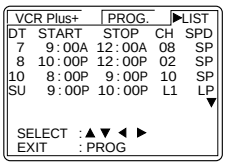
**Category Items
N/A (not applicable),
SPORTS, MOVIE, COMEDY, MUSIC, DRAMA

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

Review, Replace or Clear Program Contents:

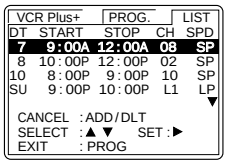
(Recording is not in progress)

1



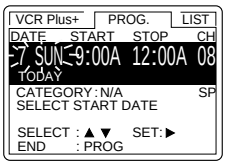
1) **Press PROG/VCR+** button.
2) **Press ◄►** to select LIST.

2



Press ▲▼ to select number.

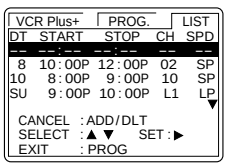
3 **To Replace program...**



1) **Press ►** to display.
2) Repeat Step 3 (p.16) to set new programs.

or

To Clear program...



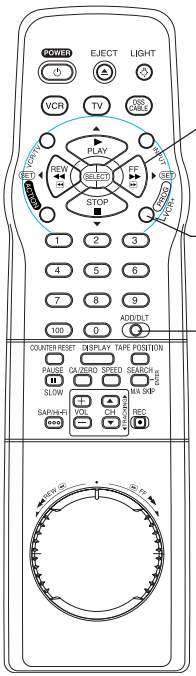
Press ADD/DLT.

4 **Press PROG/VCR+** button to end the program.

- If there are set programs, press POWER off to set timer.

To cancel a Timer Recording in progress...

Press POWER and then press STOP within 10 seconds to cancel the Timer Recording. (The TIMER indicator goes out on Multi Function Display.)



SELECT/SET
▲:PLAY
▼:STOP
◄:REW
►:FF

PROG/VCR+

ADD/DLT

Important notes when using a DSS receiver

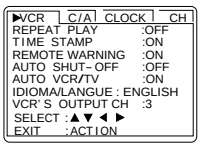
- When recording programs via a DSS receiver, the DSS receiver must be left on.
- When recording programs via an antenna or cable, the DSS receiver must be turned off.

Auto VCR Plus+ System Channel Setup (Part 1)

For [VCR-TV] or [VCR-cable box-TV] connection only.

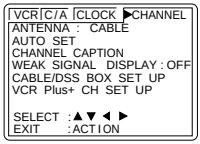
In order for VCR to read PlusCode numbers, some set up is required. Guide channel numbers are assigned to each local broadcast and cable station. Because this number sometimes differs from the channel your TV receives the station on, it is necessary to program the VCR with local channel information. To receive VCR Plus+ channels automatically, perform the steps below. Or, see "Manual VCR Plus+ System Channel Setup" section on page 20.

1



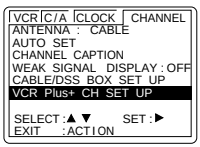
Press ACTION* to display menu**.**

2



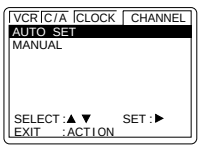
Press ◀ ▶ to select CHANNEL.

3



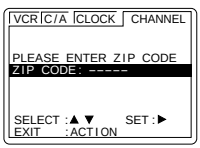
Press ▲▼ to select VCR Plus+ CH SET UP and **press ▶** to display.

4



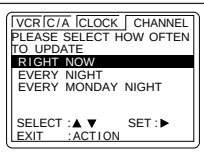
Press ▲▼ to select AUTO SET and **press ▶** to set.

5



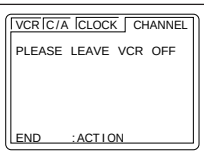
Press ▲▼◀ ▶ to enter Zip Code and enter each number. **Press ▶** or **ACTION** to set.

6



Press ▲▼ to select When to Update and **press ▶** to set.

7



Press ACTION to return to normal screen.

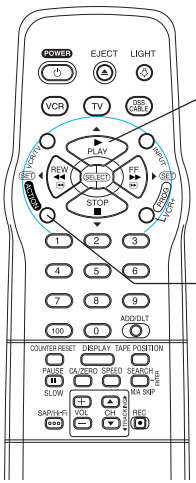
- Make sure to leave VCR off (overnight).

VCR Plus+ System is ...

a feature that allows you to set **most items** of a timer recording by simply entering a special code number (PlusCode programming number) found in TV GUIDE and selected newspaper TV listings.

Important Note

- **"Initial Setup" on pages 8 ~ 11 must be completed before "Auto VCR Plus+ System Channel Setup" can be done. If any part of setup is incomplete, a warning screen appears.**



Notes

- **When Auto Set is performed, channels set in initial setup (pp. 8 ~ 11) will be replaced by automatically downloaded data.**
- Make each entry within 1 minute or VCR will leave this mode.
- Once local channels have been programmed, they will stay in memory, even in the case of a power failure.
- If the start time for a timer recording comes up during Auto VCR Plus+ System Setup, the timer recording will have priority.

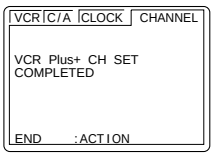
Auto VCR Plus+ System Channel Setup (Part 2)

Before you perform the following steps, you should have:

- **completed "Auto VCR Plus+ System Channel Setup (Part 1)" on page 18.**
- **left VCR off overnight, and turned it back on after 9:00 AM the next day.**

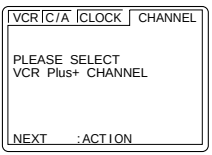
1

If channel updating was successful...



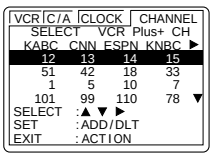
Press ACTION to exit this mode.

If VCR could not distinguish channel map...



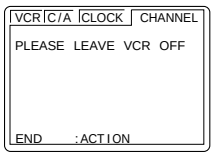
Press ACTION to display SELECT VCR Plus+ CH. Continue with step 2.

2



Press ▲▼◀▶ to select channel map for your area and **press ADD/DLT** to set.

3



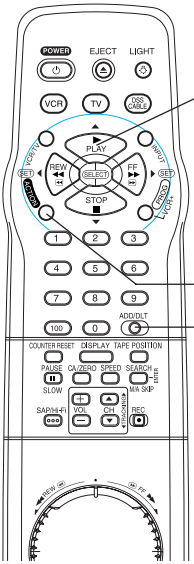
Press ACTION to return to normal screen.

- Make sure to leave VCR off (overnight).

Channel map will be updated (overnight). If it was successful, "VCR Plus+ CH SET COMPLETED" appears on screen. Press ACTION to exit.

Repeat these steps as necessary.

If Auto Setup fails, do "Manual VCR Plus+ System Channel Setup" on page 20.



SELECT/ SET
▲ :PLAY
▼ :STOP
◀ :REW
▶ :FF

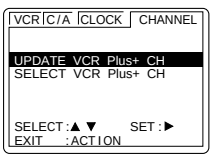
ACTION

ADD/DLT

To Change or Update Auto VCR Plus+ System Channel Setup

(E.g. you selected wrong channel map or zip code.)

a Do "Auto VCR Plus+ System Channel Setup (Part 1)" steps 1~4 on page 18.



b Press ▲▼ to select UPDATE VCR Plus+ CH or SELECT VCR Plus+ CH, then press ▶.

c If you selected UPDATE VCR Plus+ CH, perform steps 5~7 in the "Auto VCR Plus+ System Channel Setup (Part 1)" section on page 18.

If you selected SELECT VCR Plus+ CH, perform steps 2~3 in the "Auto VCR Plus+ System Channel Setup (Part 2)" section on this page.

Initial Setup.....
In order to use Timer Recording Using VCR Plus+ System, the Initial Setup on page 8 to 11 must be completed for setting Clock and Channel.

Channel Setup.....
Since numbers assigned to channels found in TV Guide and selected newspapers may differ from channels in your viewing area, you'll need to enter your local TV channel number for each corresponding Guide Channel.
If you perform the VCR Plus+ Channel set up procedures shown below, you will be able to perform timer recordings using the PlusCode programming number listed in your local TV listing.

Manual VCR Plus+ Channel Setup

For [VCR-TV] or [VCR-cable box-TV] connection only.

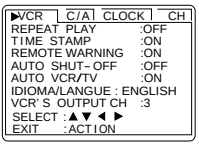
To complete step 5 of setup, do the following:

- Prepare a TV/Cable station line-up and channels they are received on. Also, the Guide channel numbers assigned to your stations (found in TV Guide and selected newspapers.)
- Make a 3-column chart (see sample).
  Left column ➛ all stations you receive.
  Middle column ➛ each station's assigned Guide channel number from TV Guide, etc.
  Right column ➛ channel number on which your TV receives the station.

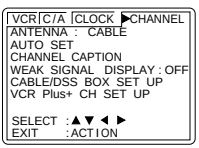
SAMPLE ONLY

Broadcast or Cable station name	Assigned Guide channel No.	Channel No. on which my TV receives the station.
HBO	33	15
Nickelodeon	38	20
CBS	04	04
FOX	11	

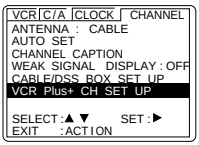
1 **Press ACTION*** to display menu.



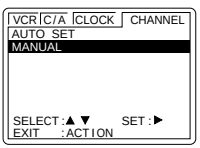
2 **Press ◀ ▶** to select CHANNEL.



3 **Press ▲▼** to select VCR Plus+ CH SET UP, and **press ▶** to set.

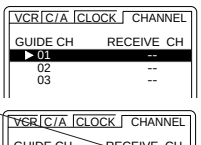


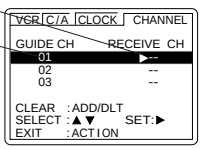
4 **Press ▲▼** to select MANUAL, and **press ▶** to set.



5 **To enter VCR Plus+ channels,**

press ▶ to move cursor to right, **press ▲▼** to enter number, **press ▶** to set, and **press ▲▼** to scroll up/down.





- Repeat step 5 until list is complete.

To Make Corrections,
press ▲▼ and **▶** to move to error, then **▲▼** to change, or **ADD/DLT** to erase number.

6 **Press ACTION twice** to return to normal screen.

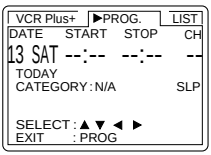
For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

VCR Plus+ System Programming

Ready Checklist

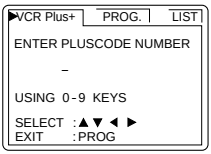
- ☐ Clock is set.
- ☐ VCR Plus+ Setup is complete (see pp. 18 - 20).

1



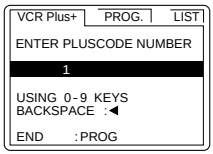
Press PROG/VCR+ button to display PROGRAM.

2



Press ◀▶ to select display VCR Plus+ screen.

3

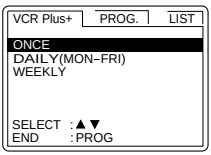


Press NUMBER keys to enter PlusCode number and **press PROG/VCR+** button to set.

To Make Corrections, press ◀ repeatedly to delete number, then repeat step 3.

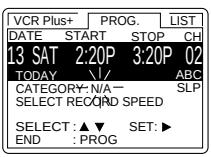
- If the PlusCode number entered begins with "0," skip to step 5. Display in step 4 will not appear.

4



Press ▲▼ to select ONCE, DAILY(MON~FRI), or WEEKLY record frequency and **press PROG/VCR+** button to set.

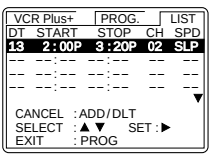
5



Press ▲▼ to select category and record speed. **Press ▶** to set.

Press PROG/VCR+ button to end program.

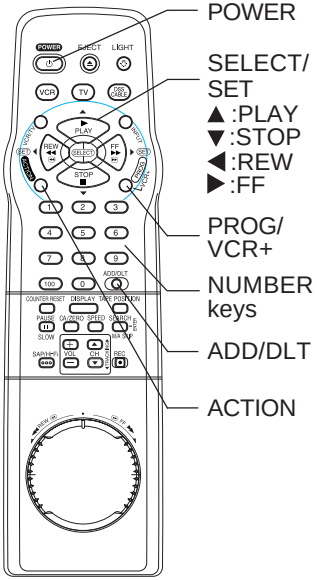
6



Press PROG/VCR+ button **again** to exit.

- **Press ADD/DLT** to delete the program.

7 **Press POWER off** to set the timer. ("TIMER" lights up on Multi Function Display.)



Do normal Timer Record if...

- PlusCode number is not listed for program.
- the program (e.g. sports event) may run over set stop time.

See page 17 to:

- cancel a timer recording in progress.
- review, replace, or clear program contents.

Important for DSS/Cable Box Users

- When recording via DSS, the receiver must be left on. When recording via cable or antenna, DSS receiver must be off.
- When recording via a cable box, leave box on and tuned to channel to be recorded.

Notes

- Do not overlap program times.
- PlusCode numbers cannot be used to program VCR to record DSS and cable box channels.
- Make each entry within 1 minute or the VCR will exit setup mode.
- Once VCR Plus+ channel setup is done, channels stay in memory. If a power interruption occurs, VCR Plus+ channel setup may be lost. Please do VCR Plus+ channel setup again.
- Obtain unlisted PlusCode numbers by calling 1 - 900 - 454 - 7587. Call costs about $.95 per minute.

Multi-Brand Control Feature

Multi-Brand Control Setup

The Remote Control can be set to control some TV and Cable box/DSS functions.

1 **Find your TV and Cable Box/DSS Receiver Brand Code Number on the following page.**

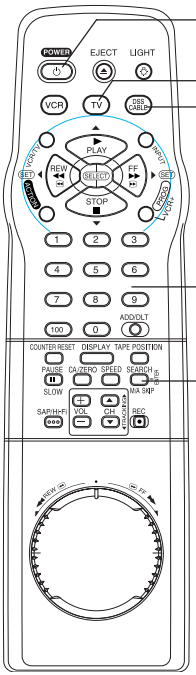
2

■ **Setup for TV control,**
➛ **hold down TV button**,
➛ enter code with **NUMBER keys**.

■ **Setup for Cable or DSS control,**
➛ **hold down DSS/CABLE button**,
➛ enter code with **NUMBER keys**.

• If code number is 100 or greater,
➛ **press 100 key**, then other digits.
E.g., press 100 - 0 - 2 for 102.

3 **Confirm code entry,**
➛ **press POWER** to turn selected unit on or off.
• See table below for controllable functions in each mode.



Notes
- Repeat setup after remote battery replacement.
- Remote will not control every TV, cable box, or DSS made by the manufacturer listed. If you get no response, your particular unit cannot be controlled. There are NO additional codes for the products listed. If your product is not listed, then the remote is not compatible with that product.

Using Multi-Brand Control

After remote is set up, you can select VCR, TV, or DSS/CABLE for the desired function.

Press VCR, or TV, or DSS/CABLE on the remote.
(Table below shows available unit buttons for each mode.)

Mode \ Unit	VCR	TV	CABLE/ DSS
VCR	All	VOL UP/DOWN	———
TV	VCR/TV, PLAY, STOP EJECT, SAP/ Hi-Fi, DISPLAY, FF, REW, PAUSE/ SLOW, REC, SPEED, CA/ZERO, COUNTER RESET, TAPE POSITION	POWER, INPUT, number keys, ENTER, CH UP/ DOWN, VOL UP/DOWN	———
CABLE/ DSS		VOL UP/ DOWN	POWER, ENTER, number keys (except 100key), CH UP/ DOWN

Notes
- Not all functions listed may be controllable.
- In TV or DSS/CABLE mode, it may be necessary to press ENTER after pressing NUMBER keys for channel selection.

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

TV Brand Code Numbers

Panasonic 01, 02
Quasar 01, 02
RCA 03
GE 03
Zenith 04
Magnavox 05
Sylvania 05
Sharp 06, 07
Sony 08
Toshiba 09
Sanyo 10
Fisher 10
JVC 11
Hitachi 12
Mitsubishi 07, 13
Samsung 14
Gold Star 15, 16, 17

Cable Box Brand Code Numbers

Archer 44, 06, 01, 120, 05, 63, 126
Cableview 29, 09, 01, 63, 120, 44, 42, 30 52, 04, 124, 126
Citizen 44, 52, 30, 63, 42, 04, 124, 126
Curtis 08, 09, 25, 61, 53, 87
Century 44, 51, 75, 59, 126
Cabletenna 29, 09, 01, 63, 120, 44, 126
Cable Cinema 29, 09, 01, 63, 120, 44, 126
Diamond 29, 09, 01, 63, 120, 44, 126
Eagle 62, 40, 22, 13, 58, 20, 26, 107
Eastern 28, 29, 130
Explorer 08, 09, 25, 61, 53, 87
Gemini 30, 04, 124
General Electric 01, 57, 120
General Instruments . 01, 84, 83, 34, 03, 02, 04, 55 65, 66, 67, 68, 120, 106, 121, 122, 115, 117, 118, 124
Gerrard 44, 51, 75, 59
GC Electronics 44, 42, 63, 29, 30, 52, 04 124, 126
Hamlin 41, 14, 15, 28, 102, 104, 103, 130
Hitachi 31
Jerrold 01, 84, 83, 34, 03, 02, 04, 55, 65, 66 67, 68, 120, 106, 121, 122, 115, 117, 118, 124
Jasco 30, 04, 124
Macom 31
Magnavox 26, 112
Matsushita 17, 16, 08, 87, 109
Movietime 32, 39, 42, 44, 126, 38, 40
Maestro 74, 35
NEC 40, 19, 38, 32
NSC 40, 19, 38, 32
Novavision 08, 09, 25, 61, 53, 87
Next Level 01, 84, 83, 34, 03, 02, 04, 55, 65 66, 67, 68, 120, 106, 121, 122
Oak 46, 11, 129, 101
Oak Sigma 46, 11, 129, 101
Panasonic 17, 16, 08, 87, 109
Philips 23, 24, 20, 13, 07, 50, 128, 129
Pioneer 06, 05, 12
Pulsar 04, 42, 63, 44, 30, 52, 124, 126
Quest 06, 05, 12
Radio Shack 44, 51, 75, 59, 126
RCA 17, 16, 08, 87, 109
Realistic 44, 51, 75, 59, 126
Recoton 44, 51, 75, 59, 126
Regal 41, 14, 15, 28, 102, 104, 103, 130
Regency 28, 29, 130
Rembrandt 44, 42, 63, 29, 01, 32, 39, 120, 126
Samsung 42, 06, 32, 05, 40
Scientific Atlanta 08, 09, 25, 61, 53, 87
Sheritech 27
Signal 26, 112
SL Marx 42, 06, 32, 40, 43, 44, 52, 63, 126
Sprucer 17, 16, 08, 87, 109
Standard Components 32, 39, 42, 44, 126
Stargate 04, 42, 32, 40, 63, 44, 30, 52, 06 124, 126
Sylvania 19, 18
Teknika 74, 35
Telecaption 77, 127
Teleview 40, 19, 38, 32, 42, 06
Texscan 19, 18
Tocom 34, 33, 01, 42, 66, 120
Toshiba 36
Unika 44, 42, 63, 29, 01, 126, 120
Universal 52, 43, 44, 63, 42, 126
Viewstar 62, 40, 22, 13, 58, 20, 26, 107
Videoway 07, 23, 50, 129
Vidtek 64
Zenith 07, 23, 50, 129

DSS Brand Code Numbers

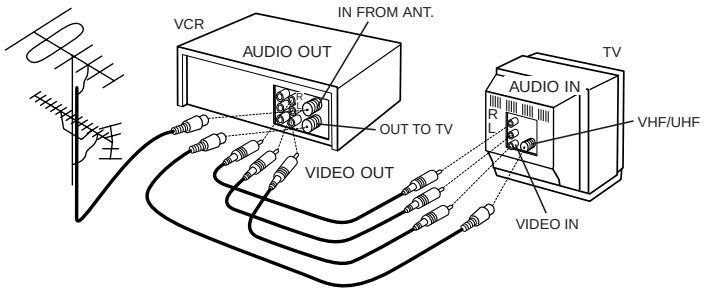
Toshiba 90
Hitachi/ Hughes 91, 99
Primestar 92
Drake 93
Magnavox 94, 95
Uniden 94, 95
Optimus 94, 95
Panasonic 96
ProScan 97
RCA 97
SONY 98, 105

Important Notes

- Due to changes in infra-red commands used by manufacturers, some brands have several codes. If your unit does not respond to the first code, please try the next one.
- Some TV, Cable Box and DSS Box brands require you to turn on the power manually.

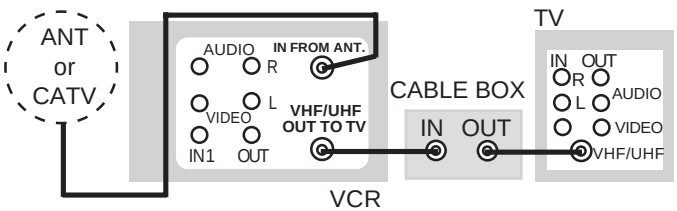
Audio/Video Connection

If your TV has AUDIO IN and VIDEO IN terminals, you can connect your VCR to them to receive higher quality picture and sound.



1. Connect the VIDEO OUT terminal on the VCR to the VIDEO IN terminal of your TV.
2. Connect the “L” and “R” AUDIO OUT terminals on the VCR to the “L” and “R” AUDIO IN terminals of your TV.
3. Set the VIDEO/TV selector of your TV (Monitor/Receiver) to “VIDEO.”

■ With a Cable Box (VCR ➡ Cable Box)



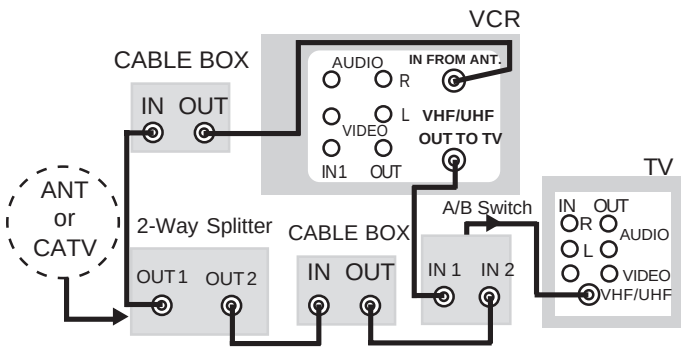
You Can

- view any (including scrambled) channel.
- use VCR Remote Control to select channels without using Multi-brand control feature.

You Cannot

- record scrambled channels.

■ Connect With Two Cable Boxes



You Can

- record and view both scrambled and unscrambled channels if additional equipment is added. This connection requires: two converter boxes, an A/B switch, and a 2-way splitter.

You Cannot

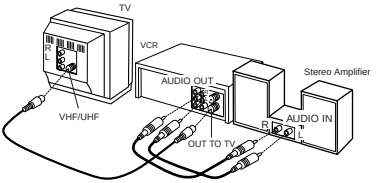
- view channel other than the one selected for any type of recording.
- do a Timer recording of a channel unless you select it at the cable box.

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

Connection

Make the Audio/Video Connection as shown on the previous page.

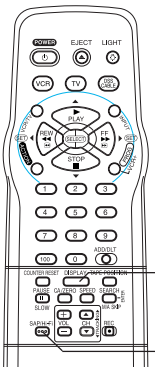
- You can use a TV connected to a Stereo amp and speakers instead of a Stereo TV.



Receivable Broadcast Types

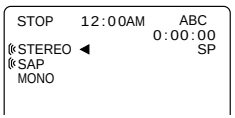
The following are possible audio broadcast types and on-screen displays. The signal being received is indicated with an "((" mark while the selected audio mode is indicated with an arrow.

To display the broadcast signal being received, ➔ **press DISPLAY.**



MTS Stereo and SAP broadcast

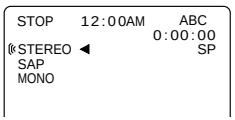
Multi-channel Television Sound Stereo (main language) and Secondary Audio Program (sub language) broadcasts are being received simultaneously. Select STEREO or SAP audio mode.



MTS Stereo broadcast

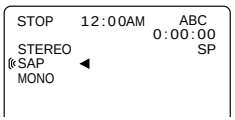
Multi-channel Television Sound Stereo broadcast. Select STEREO audio mode.

- If stereo broadcast is weak and display flickers, select MONO audio mode for possibly better results.



SAP broadcast

Secondary Audio Program (sub language) broadcast. Select SAP audio mode for the sub language.



MONO broadcast

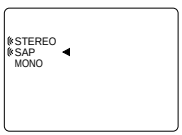
Normal monaural sound broadcast.

Equipped with dbx®-TV Noise Reduction for true MTS reproduction. dbx®-TV Noise Reduction is required for good stereo separation and audio fidelity. dbx® is a registered trademark, and is licensed by dbx® Technology Licensing.

Audio Mode for Recording

1 **Press SAP/ Hi-Fi** to display audio mode.
(Display disappears after 5 seconds.)

2



Press SAP/ Hi-Fi repeatedly to select desired mode.

- Refer to "Receivable Broadcast Types" above.
- Arrow indicates selection.

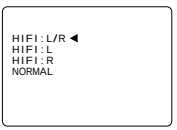
3 **Do a recording.**
See page 15.

Audio Mode for Playback

1 **Start playback.**
See page 14.

2 **Press SAP/ Hi-Fi** to display audio mode.
(Display disappears after 5 seconds.)

3



Press SAP/ Hi-Fi repeatedly to select desired mode.

- Arrow indicates selection.
- Select "HIFI(L/R)" or "HIFI(L)" or "HIFI(R)" to listen to stereo recordings in stereo sound. Select "NORMAL" for monaural sound.

Notes

- Only tapes recorded in Hi-Fi stereo will playback with true stereo sound. Standard stereo tapes will playback in monaural sound.
- To listen to Hi-Fi stereo playback, the VCR AUDIO (L/R) jacks must be connected to a stereo TV or an external stereo amp and speakers. (See top of this page.)
- If tracking is adjusted during playback, Hi-Fi audio may revert to normal audio.
- Hi-Fi and normal audio playback volume level may differ.

Tape Operation

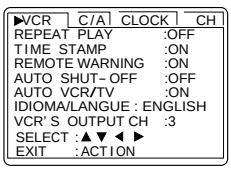
COMMERCIAL ▸▸ADVANCE®

COMMERCIAL ▸▸ADVANCE® detects and marks the beginning and end points of commercials on your tape for recordings over 15 minutes in length. When COMMERCIAL ▸▸ADVANCE® marked tape is played back, the VCR a automatically advances through the commercial segments at high speed. You can also set this feature to Manual so as to have more control over the advance process. The effectiveness of this system can vary due to differences in the way television stations broadcast. See page 28 for answers to the most commonly asked questions about this feature.

COMMERCIAL ▸▸ADVANCE® Marking

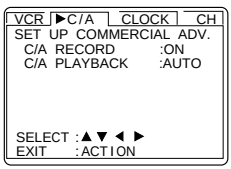
When C/A RECORD: ON, VCR automatically rewinds the tape after a recording has been made and marks the beginning and end of any detected commercial blocks. After marking is done, the tape is returned to the end of the recording. Commercials are not erased from the tape.

1



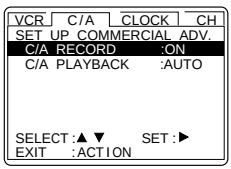
Press ACTION*
to display menu.

2



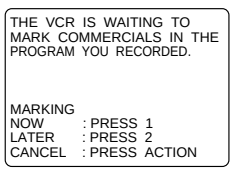
Press ◀▶
to select C/A and display SET UP COMMERCIAL ADV.

3



Press ▲▼
to select C/A RECORD and **press ▶** to set.

ON Timer Recording, VCR Plus+ System, and One Touch recordings are marked automatically.



When STOP is pressed during normal recording, Select One of a) or b) or c).

a) Press 1 key to mark the recording now.
"NOW MARKING COMMERCIALS" appears.

b) Press 2 key to mark the recording later (after the power has been turned off).

• If the tape is rewound and another recording started before the power is turned off, commercials may not be marked correctly.

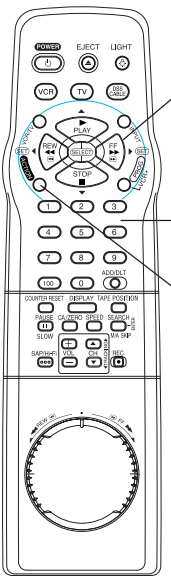
c) Press ACTION to cancel the marking of this recording.

OFF The VCR will not mark commercials.
When you are editing or dubbing a tape, or when you do not wish to use this feature, OFF should be selected.

4 **Press ACTION again**
to return to normal screen.

Ready Checklist

- ☐ All connections are made.
- ☐ One time Setup completed.
- ☐ VCR is plugged in.
- ☐ TV is turned on and set to CH3, 4 or Video on TV.



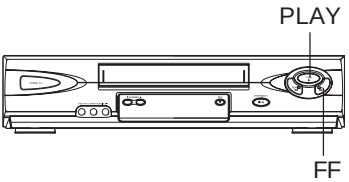
Note

- When using the timer to record two adjacent shows on the same channel, better accuracy can be obtained by programming each shows separately.

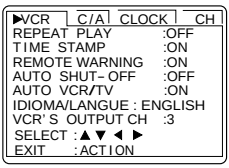
For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

COMMERCIAL ADVANCE® Playback

When playing back a recording which has been marked using the COMMERCIAL ADVANCE® feature, you can either set VCR to automatically advance through marked commercial blocks, or set it so that commercials are only skipped on your command.

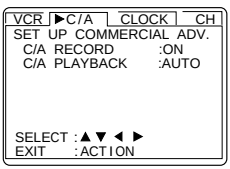


1



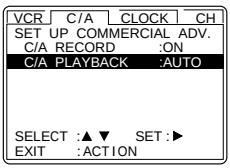
Press ACTION to display menu.

2

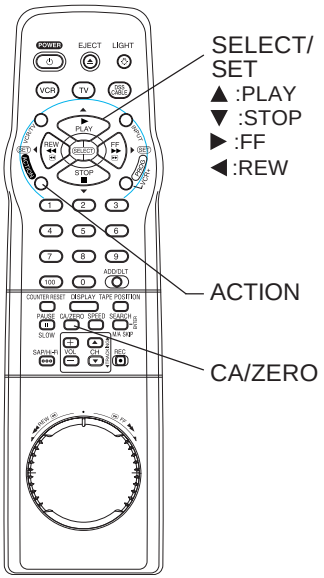


Press ◀▶ to select C/A and display SET UP COMMERCIAL ADV.

3



Press ▲▼ to select C/A PLAYBACK and **press ▶** to set.



AUTO : VCR will automatically advance through marked commercial blocks recorded on the tape and then resume playback.

MANUAL : VCR will advance through commercials only when CA/ZERO is pressed. Playback will resume when the end mark of a commercial block is found, or a new recording or blank portion is detected, or after 8 minutes.

4 **Press ACTION again** to return to normal screen.

COMMERCIAL ADVANCE® and MOVIE ADVANCE® are registered trademarks of SRT, Inc. A Jerry Iggulden invention licensed in association with Arthur D. Little Enterprises, Inc.
U.S.Pat. No. 5,333,091; 5,692,093; 5,696,866 other patents pending

Notes

- The selection mode in step 3 remains set unless there is a power outage in which case the original factory setting will be restored.
- If playback is started in the middle of a commercial, only a single commercial is shown, or an individual commercial is longer than 1 minute, the commercial may not be skipped. Press FF to quickly advance through the commercial.
- Part of a recorded program may be skipped over if the program portion between commercials is less than 1 minute or there are frequent dark and quiet scenes during the program. To view the portion of tape being incorrectly skipped, press PLAY while the VCR is skipping, reverse the tape to a point just prior to where the skipping began and press PLAY again. This time the group will not be automatically skipped. Automatic skipping will be re-enabled when the end of the marked group is detected.

Tape Operation (continued)

The most commonly asked questions about COMMERCIAL▸▸ADVANCE® are answered below.

Question	Answer
How fast does the VCR advance through commercials?	The VCR advances through a 3-minute commercial block in about 8 to 12 seconds if the tape speed is SLP. In SP, it takes about 25 to 35 seconds.
Are commercials advanced through only when I playback a recording?	Yes. The commercials are not marked until after the recording is finished.
Are commercials still recorded on the tape in case I choose to view them sometime?	Yes. By setting the C/A PLAYBACK to MANUAL, see page 27, you can view or advance through commercials as desired.
Does COMMERCIAL▸▸ADVANCE® work in all recording speeds?	Yes. COMMERCIAL▸▸ADVANCE® works in SP, LP, and SLP.
Does the VCR advance through commercials each time I playback tapes which were recorded using COMMERCIAL▸▸ADVANCE®?	Yes. As long as C/A PLAYBACK is set to AUTO, see page 27, the VCR should advance through commercials each time the tape is played back.
After marking commercials, does the VCR stop at the end of the tape, or rewind to the beginning?	The tape stops at the end of the recording so that any additional timer recordings can be performed.
Can I play my COMMERCIAL▸▸ADVANCE® recordings in non-COMMERCIAL▸▸ADVANCE® VCRs?	Yes. COMMERCIAL▸▸ADVANCE® marked recordings will play in non-COMMERCIAL▸▸ADVANCE® VCRs, but commercials will not be advanced through.
Does the marking process interfere with other programmed recordings?	No. If the interval between 2 or more timer programs is not sufficient to mark the recording, marking will be done after all recordings are complete and the power goes off.
What happens if I cancel the marking in progress so I can use the VCR?	Marking will be resumed when the VCR's power is turned off as long as the tape has not been ejected.
What if part of my program is advanced through along with the commercials?	Please see the 3rd note on page 27.

Additional Notes:

- Because of the various ways in which commercials are broadcast, the VCR may not be able to recognize all commercials.
- If a timer recording is scheduled for the middle of the night, please be aware that the VCR will make some noise as it rewinds and fast forwards the tape while marking commercials.

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A Jerry Iggulden invention licensed in association with Arthur D. Little Enterprises, Inc.

U.S.Pat. No. 5,333,091;
5,692,093; 5,696,866
other patents pending

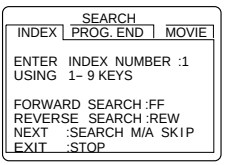
MOVIE ▸▸ ADVANCE®

MOVIE ▸▸ ADVANCE® helps you locate certain parts of prerecorded movies (rented or purchased). The feature works in two ways.
- You can go to the beginning of the movie.
- You can skip from one preview to the next.

MOVIE ▸▸ ADVANCE® works only on tapes recorded in SP speed with the record tab removed.

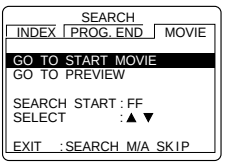
1 **Insert a tape <u>without record tab</u>.**

2



Press SEARCH/ M/A SKIP* to display SEARCH.

3

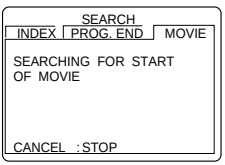


Press SEARCH/ M/A SKIP twice to select MOVIE and **press ▲▼** to select GO TO START MOVIE or GO TO PREVIEW.

<u>Select "GO TO START MOVIE,"</u> if you want to advance directly to beginning of the movie.
➛ continue with step 4.

<u>Select "GO TO PREVIEW,"</u> if you want to view the first (next) preview.
➛ go to "To Search for Preview" at right.

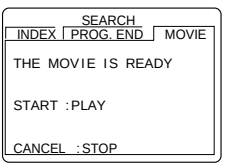
4



Press FF to start searching.
- To cancel, **press STOP**.

When the movie is found...

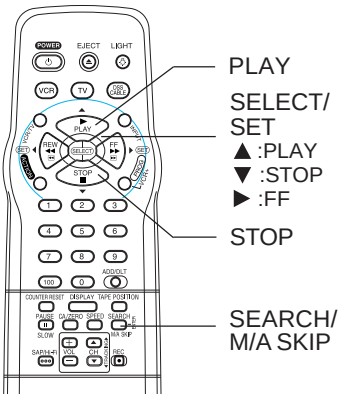
5



Press PLAY to start playback.
- To cancel, **press STOP**.

Ready Checklist

- ☐ All connections are made.
- ☐ One time Setup completed.
- ☐ VCR is plugged in.
- ☐ TV is turned on and set to CH3, 4 or Video on TV.



To Search for Preview.

You can override the operation of MOVIE ▸▸ ADVANCE® SEARCH FOR PREVIEWS mode by pressing SEARCH/ M/A SKIP during tape searching.
MOVIE ▸▸ ADVANCE® works by searching the tape past each preview and then reversing back to the start of the detected preview.
While the tape is reversing back, if SEARCH/ M/A SKIP is pressed, MOVIE ▸▸ ADVANCE® will begin searching for the next preview.
While searching for the next preview, if you see the start of a preview which you wish to watch, press SEARCH/ M/A SKIP and MOVIE ▸▸ ADVANCE® will immediately reverse back to the start of that preview, instead of searching further past the preview start point. Once the VCR is playing a preview, press SEARCH/ M/A SKIP to advance to the next preview, long commercial or the start of the movie (whichever is next).

1 **Start preview searching.**
1) In step 3 at left, select GO TO PREVIEW.
2) **Press FF**.
- If you want to playback, **press PLAY**.

When a preview is detected, VCR will start playback.

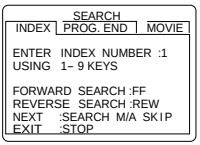
2 **Start next preview searching.**
Press SEARCH/ M/A SKIP.
- To cancel, **press STOP**.

Search System

For each recording, an invisible index mark is placed on the tape. A program index and information are also included for timer recordings. These marks are used to access or scan recordings.

Index Search

1

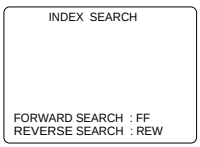


Press SEARCH/ M/A SKIP* to display SEARCH in Stop or Play mode, and then **press NUMBER keys** to select recording number.

- To calculate number, see below.

Press FF or **REW** on the remote to start search.

2



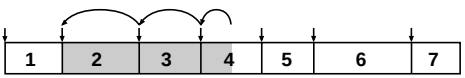
Play begins at end of search.
To search forward or back 1 index, **press FF** or **REW** on the remote or VCR while screen left is displayed (10 sec.).

- To cancel, **press PLAY** or **STOP**.

To Calculate Index Number

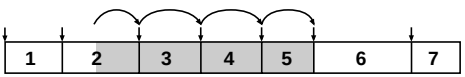
Example 1:

To go to rec. 2 from rec. 4, enter 3 and press REW.



Example 2:

To go to rec. 6 from rec. 2, enter 4 and press FF.



NOTE: ↓ indicates start points of each recording.

Note

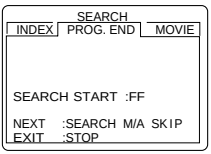
- If Index Search is started very close to an index mark, that index mark may not be counted in the search.

Program End Search

Locates end point of recording for continuity.

1 **Press SEARCH/ M/A SKIP twice** to display SEARCH in Stop or Play mode.

2



Press FF on the remote to start PROGRAM END SEARCH.

- To cancel, **press PLAY** or **STOP**.

Examples of **Program End Search**.

Fig. 1

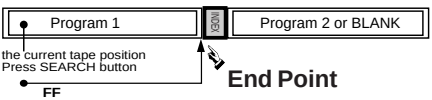


Fig. 2

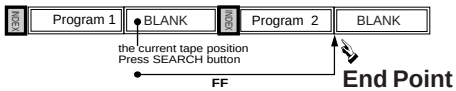
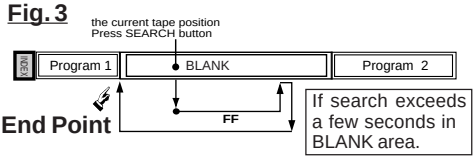


Fig. 3



Upon locating end point,

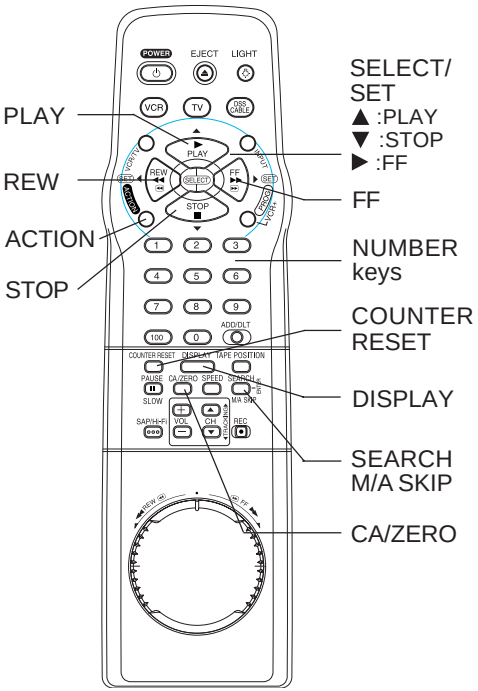
- ➛ search continues 7 sec. past end point,
- ➛ tape rewinds to 10 sec. before end point,
- ➛ tape plays to end point and stops.

Note

- If Program End Search is started very close to an index mark, that mark may be skipped over.

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

*__Important:__ If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

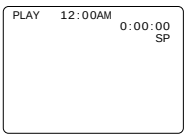


Zero Search

To quickly return to a specified tape location.

1 **Press DISPLAY during play** to display Counter.

2

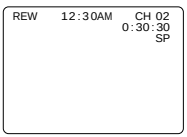


Press COUNTER RESET at desired position to reset to "0:00:00".

3 **Continue to record, playback etc.**

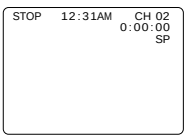
4 **Press STOP.**

5



Press CA/ZERO in Stop mode to start ZERO SEARCH.

- Unit will go into FF or REW mode and stop at the last point the Counter was set to 0:00:00.

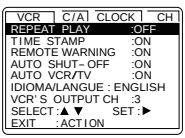


Repeat Play

Set to playback a recording over and over.

1 **Press ACTION** to display menu.

2



Press ▲▼ to select REPEAT PLAY and **press ▶** to set ON or OFF.

ON: Play repeats at tape end or if unrecorded portion over 30 sec. is detected.

3 **Press ACTION** to return to normal screen.

Auto Operation Functions

■ Auto Play

Insert a tape ➔ Power comes on,
➔ Play starts if no record tab (see p. 4).

■ Auto Rewind

Play
Fast Forward ➔ Tape end, ➔ Rewind

■ Play Auto Eject

(Repeat Play must be off)

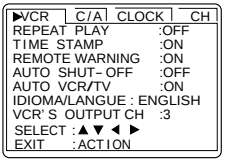
Play, ➔ Tape end, ➔ Rewind,
➔ Tape ejects if no record tab

Channel Caption

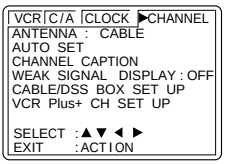
When set, station name, e.g. ABC, CBS, and channel number appear on-screen.
Set up to 24 preset captions, and/or 10 manually created captions.

☐ You need a list of stations and the channel numbers you receive them on.

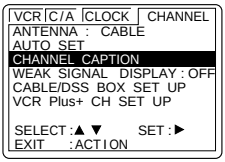
Preset Caption

1 

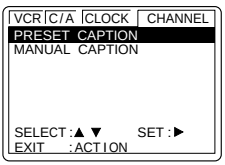
Press ACTION* to display menu.

2 

Press ◀▶ to select CHANNEL.

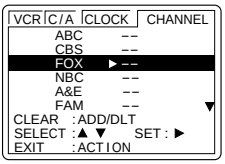
3 

Press ▲▼ to select CHANNEL CAPTION and **press ▶** to set.

4 

Press ▲▼ to select PRESET CAPTION and **press ▶** to set.

- To create your own captions, go to "Manual Caption" on right.

5 

- Repeat step 5 until the list is complete.

Assign preset captions.

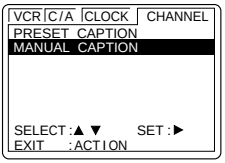
1) Press ▲▼ to highlight caption.
2) Press ▶ to move cursor to the right.
3) Press ▲▼ to select CH number.
4) Press ▶ to set.

To make corrections,
Press ▲▼ and **▶** to select the channel number, then **press ▲▼** to change, or **ADD/DLT** to delete the number.

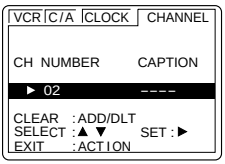
6 **Press ACTION twice** to return to normal screen.

Manual Caption

1 **Do "Preset Caption" steps 1~3 on left.**

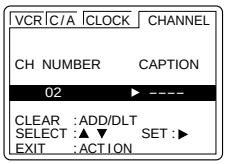
2 

Press ▲▼ to select MANUAL CAPTION and **press ▶** to set.

3 

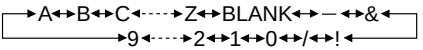
Press ▲▼ to select CH NUMBER and **press ▶** to move cursor to the right.

- Channels already set and channels deleted from Channel Memory are not displayed.
- You can set a total of ten channel captions.

4 

Press ▲▼ to enter CAPTION and **press ▶** to set.

- Characters change in following order.



- Repeat steps 3 and 4 as desired.

To make corrections,
Press ◀▶ to move to the incorrect entry, then **press ▲▼** to make correction.
Or, **press ADD/DLT** to clear the caption.

5 **Press ACTION twice** to return to normal screen.

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

*__Important:__ If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Remote Warning ON/OFF Feature

If Multi-brand feature is used (p. 22), and this feature is set to on, a warning appears whenever an invalid key is pressed in TV, DSS, or Cable mode.

1 **Press ACTION** to display menu.

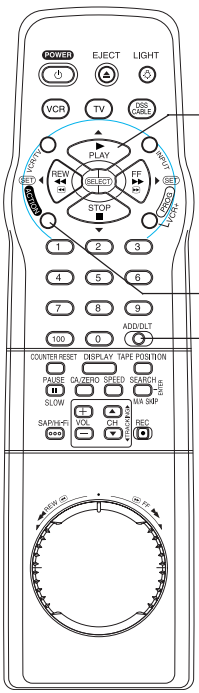
2

VCR	C/A	CLOCK	CH
REPEAT PLAY		:OFF	
TIME STAMP		:ON	
REMOTE WARNING		:ON	
AUTO SHUT-OFF		:ON	
AUTO VCR/TV		:ON	
IDIOMA/LANGUE : ENGLISH			
VCR'S OUTPUT CH		:3	
SELECT:▲▼		SET:▶	
EXIT	:ACTION		

Press ▲▼ to select REMOTE WARNING and **press ▶** to set ON or OFF.

- If “OFF,” remote warning will not appear if invalid key is pressed.

3 **Press ACTION** to return to normal screen.



SELECT/ SET
▲:PLAY
▼:STOP
◀:REW
▶:FF

ACTION

ADD/ DLT

VCR Lock Feature

When set to ON, all operations except for timer record and tape eject are prohibited. Useful for households with small children.

VCR LOCK ACTIVATED

To turn on, hold down REC on the VCR in Stop mode with no tape inserted for 7 sec. (Please ignore the NO CASSETTE warning.)

VCR LOCK OFF

To turn off, repeat above.

- VCR Lock cancels in 24 hours if clock is set.

Advanced Operation

Special VCR Features (continued)

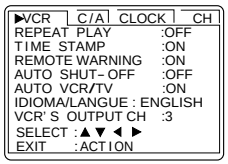
Time Stamp Feature

The VCR writes program data (see example below) about the first 10 seconds of every recording.
The information is then displayed the first 10 seconds of playback.

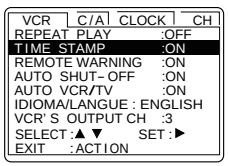
Ready Checklist

- ☐ Clock is set to correct time.
- ☐ Record tab in place. (See p. 4.)

1 **Press ACTION*** to display menu.

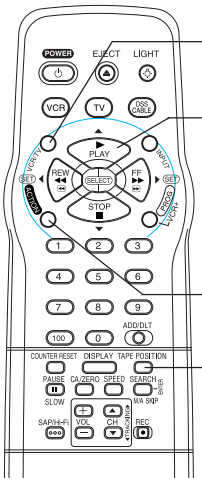


2 **Press ▲▼** to select TIME STAMP and **press ▶** to set.



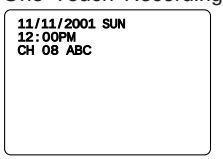
- When "OFF" is selected, the program data is written on the tape, but will not be displayed.

3 **Press ACTION again** to return to normal screen.

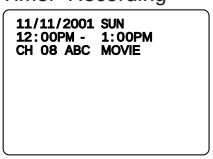


<Time Stamp Example>

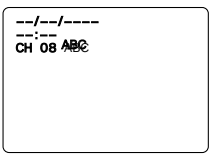
One Touch Recording



Timer Recording



When Clock is not set...

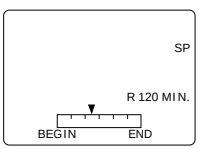


Tape Position and Tape Status Feature

To find out the present tape position and amount of tape remaining.
Tape position is displayed for VHS-C Cassettes type, tapes under 30 minutes, and some other tapes, but the position is not correct.

1 **Press TAPE POSITION** to detect current tape position.

- "DETECTING TAPE POSITION" is displayed only when a cassette is first inserted, and it takes several seconds for correct tape position to appear.



- The present tape position indication and amount of tape remaining (according to tape speed) is displayed.
- Tape remaining time display may not be precise.

2 **Press TAPE POSITION** to return to normal screen.

Note

This function cannot display exact amount of tape remaining for tapes 30 minutes or less, or for tapes over 120 minutes in length.

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

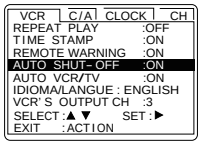
*__Important:__ If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Auto Shut-Off Feature

The power shuts off at a preset time.

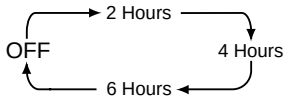
1 **Press ACTION** to display menu.

2



Press ▲▼ to select AUTO SHUT-OFF. **Press ▶** repeatedly to change shutoff time as shown below.

3 **Press ACTION** to return to normal screen.



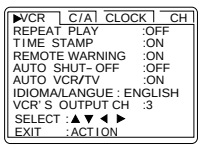
Note

The shut-off countdown will not function during Play or Record.

VCR/TV Selector Feature

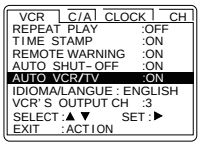
The VCR VCR/TV selection can be set to auto or manual.

1



Press ACTION to display menu.

2



Press ▲▼ to select AUTO VCR/TV. **Press ▶** to set ON or OFF.

- OFF(Manual): You select “VCR” or “TV” mode using the VCR/TV button on the unit or remote.
- ON(Auto): “VCR” mode is automatically set when VCR is turned on, or in Play mode.

3 **Press ACTION** to return to normal screen.

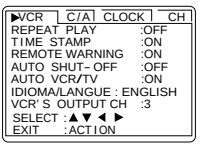
Note

For more on VCR/TV selection, see “Record one station, watch another” and “Select channels at VCR” sections (p.15).

Weak Signal Display ON/OFF Feature

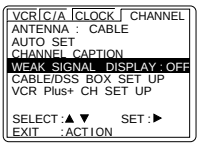
When set to “ON,” picture is displayed regardless of signal strength.

1



Press ACTION to display menu.

2



Press ◀ ▶ to select and display CHANNEL. **Press ▲▼** to select WEAK SIGNAL DISPLAY, and **press ▶** to set ON or OFF.

- ON: Picture is displayed despite signal condition an may have poor quality.
  OFF: Screen turns solid blue when signal is weak or non-existent.
- Selecting ON has no effect on connected equipment with blue back feature.

3 **Press ACTION** to return to normal screen.

Shuttle Variable Speed Search

The SHUTTLE Ring allows you to smoothly control the tape speed during special effects playback in both forward or reverse.

Begin the forward or reverse search.

Turn SHUTTLE Ring while in Play or Still mode.

- The more you turn the Ring, the faster the search speed will be.

Release the Shuttle mode.

Press a function button such as : PLAY, STOP, etc.

- The VCR performs the function of the button pressed.

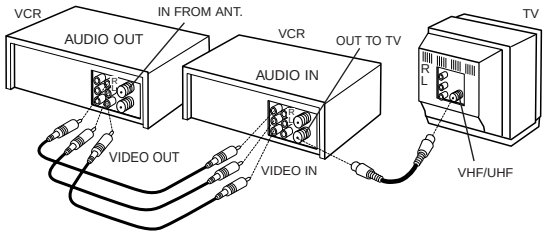
Notes

- When the SHUTTLE Ring is turned more than half in Stop mode, normal Fast Forward or Rewind will begin.
- Some noise bars are normal during Shuttle operation.
- After 3 minutes in Still or Slow, the VCR will go into Stop mode.
- When the SHUTTLE Ring is released, the VCR goes into Still mode.

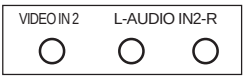
Copying Your Tapes (Dubbing)

Connection

(Rear Connection shown.)



Front of VCR



(Audio/Video In Terminals on the front of VCR are available)

① Connect VIDEO OUT terminal on Playing VCR to VIDEO IN terminal on Recording VCR. To monitor the dubbing, also connect a TV as shown.

② Connect "L" and "R" AUDIO OUT terminals on Playing VCR to "L" and "R" AUDIO IN terminals on Recording VCR.

In place of a Playing VCR, you can use other equipment, such as a Camcorder. Simply connect the unit's Audio/Video outputs to the Recording VCR.

	Playing (Source) VCR	Recording (Editing) VCR
1	Insert pre-recorded tape.	Insert blank tape with record tab.
2	———	Press INPUT to set VCR Input mode to LINE1 for Video Input (Rear) or to LINE2 for Video Input (Front). (See "Selecting the Input Mode" below.)
3	Press PLAY, then PAUSE/SLOW immediately to enter PLAY/PAUSE mode.	Press REC, then PAUSE/SLOW immediately to enter REC/PAUSE mode.
	The operation of steps 4 and 5 must be done on both playing and recording VCRs at the same time.	
4	Press PLAY to start dubbing. Playing VCR starts playback.	Press PAUSE/SLOW to start dubbing. Recording VCR starts recording.
5	Press STOP to stop dubbing.	Press STOP to stop dubbing.

■ To Monitor Dubbing on Your TV

1 Turn your TV on and tune to the Recording VCR channel (CH3 or CH4).

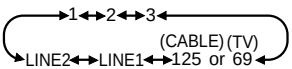
2 Set the VCR/ TV Selector on the Recording VCR to "VCR."

Note Dubbing tapes protected with Copy Guard will have poor quality results.

■ Selecting the Input Mode

Method 1: Press INPUT repeatedly.
Channel Number ↔ LINE1 ↔ LINE2

Method 2: Press CH ▲ / ▼.
Display will change as below.



- "L1" or "L2" lights on Multi-Function Display (about 4 sec.) when LINE1 or LINE2 is selected.
- LINE1: For rear audio/video connection.
  LINE2: For front audio/video connection.

Caution: Unauthorized exchanging and/or copying of copyrighted recordings may be copyright infringement.

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

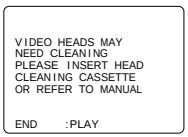
VCR & Cassette Information

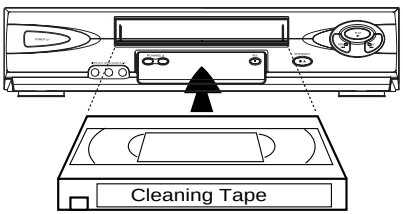
Head Cleaning

Playing older or damaged tapes may eventually cause video heads to become clogged.

Video Head Clog Sensor

During playback, this screen appears if clogging is detected. To remove screen, press PLAY on the remote or VCR.





- **Use "dry" type head cleaning cassette only.** (Part No. NV-TCL30PT is recommended.)
- Follow cleaning tape instructions carefully. Excessive use of tape can shorten head life.

Cleaning the VCR

Use a soft cloth or dusting attachment of a vacuum cleaner to remove dust from the ventilation holes on the back sides and bottom of the cabinet.

Plastic surfaces are easily scratched and can be marred by alcohol and various solvents. Avoid excessive use of oil-based furniture polishes since the materials used in the cabinet will accumulate more dust.
We recommend using a nonabrasive, antistatic cleaner and polisher.

Specifications

Power Source:	120 V AC, 60 Hz
Power Consumption:	Power On Approx. 23 watts Power Off Approx. 3.0 watts
Video Signal:	EIA Standard NTSC color
Video Recording System:	4 rotary heads helical scanning system
Audio Track:	1 track (Normal) 2 channel (Hi-Fi Audio Sound)
Tuner:	
Broadcast Channels:	VHF 2 ~ 13, UHF 14 ~ 69
CABLE Channels:	Midband A through I (14 ~ 22) Superband J through W (23 ~ 36) Hyperband AA ~ EEE (37 ~ 64) Lowband A-5 ~ A-1 (95 ~ 99) Special CABLE channel 5 A (01) Ultraband 65 ~ 94, 100 ~ 125
Operating Temperature:	5 °C ~ 40 °C (41 °F ~ 104 °F)
Operating Humidity:	10 % ~ 75 %
Weight:	2.7 kg (6.0 lbs).
Dimensions:	430 (W) x 98 (H) x 242 (D) mm 16-15/16" (W) x 3-7/8" (H) x 9-9/16" (D) inch

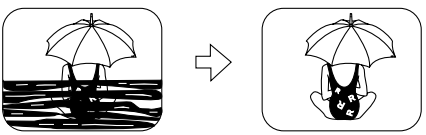
Note: Designs and specifications are subject to change without notice.

Features for a Quality Picture

Digital Auto Picture
Automatically controls the video output signal for less noise depending on the tape condition.

Digital Auto Tracking
Continuously analyzes the signal and adjusts for optimum picture quality.

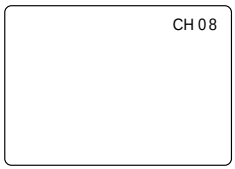
Manual Tracking Control (to reduce picture noise)
Use during Playback and Slow Motion mode to reduce picture noise.
Press CH (TRACKING) ▲/▼ on the remote control or VCR until the picture clears up.
To return to Auto Tracking, **press POWER** off, then on again a few seconds later.



V-Lock Control (to reduce picture jitter)
In Still mode, **CH** (TRACKING) ▲/▼ operate as a V-Lock control.

On-Screen Displays (OSD)

Function & Channel Displays



When a function button is pressed, e.g. PLAY, or you change channels, a 5-second display appears.

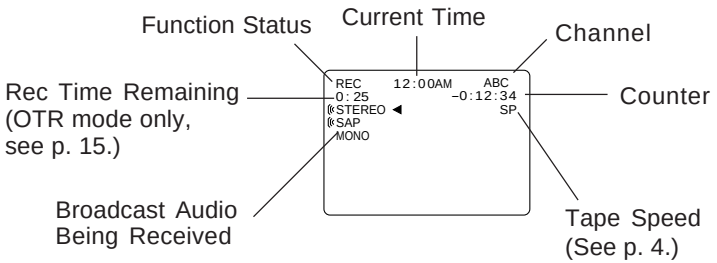
Blank Tape/ No Video Signal Indications

Whenever a blank section of a tape comes up in Play mode, or when the selected channel has no broadcast signal with the Weak Signal Display Feature (p. 35) set to OFF, the TV screen will turn solid blue.

VCR Status & Clock Displays

To display or remove overlay at right,

➛ **press DISPLAY**.



Warning and Instruction Displays

These displays will alert you to a missed operation or provide further instructions.

OSD	Caution	Page	OSD	Caution	Page
PLEASE SET CLOCK BY PRESSING ACTION KEY	If you attempt to set or review a Timer Recording and the Clock is not set...	16	VIDEO HEADS MAY NEED CLEANING PLEASE INSERT HEAD CLEANING CASSETTE OR REFER TO MANUAL END :PLAY	If head cleaning becomes necessary while playing back a tape...	37
TURN VCR OFF FOR TIMER RECORDING	After a Timer Program has been set...	16	VCR LOCK ACTIVATED	If you press a function buttons other than STOP/EJECT or POWER while the VCR is in VCR Lock mode...	33
CHECK CASSETTE RECORD TAB	If you press REC on the remote control or VCR, and a cassette is inserted with no record tab...	4	REMOTE CONTROL IS SET TO CABLE/DSS MODE USE VCR : VCR KEY	If you press an invalid key on the remote while in CABLE/DSS mode...	22 23 35
NO CASSETTE	If you press PLAY, FF, REW, or REC on the remote control or VCR without a cassette inserted...	14 15	REMOTE CONTROL IS SET TO TV MODE USE VCR : VCR KEY	If you press an invalid key on the remote while in TV mode...	22 23 35
TO CANCEL TIMER REC PRESS POWER THEN STOP KEY	If you press POWER or STOP during a Timer Recording... (visible in VCR mode only)	16			

For assistance, please call : 1-800-211-PANA(7262) or send e-mail to : consumerproducts@panasonic.com

Before Requesting Service

Check the following points once again if you are having trouble with your VCR.

Power	Correction
No power…	• Completely insert Power Plug into an AC outlet. • Set POWER button to on. • Make sure power source is active.
Recording & Playback	**Correction**
TV program cannot be recorded...	• Check connections between VCR, external antenna, and TV. • Check channel selections. • Make sure your antenna system (CABLE or TV) is correctly set. (Channels [P. 12]) • Make sure cassette record tab is intact. (P. 4)
Timer recording cannot be performed…	• Confirm that clock is set to current time and date. • Make sure Cable/DSS box (if used) is left on and tuned to channel to be recorded. • Set recording start/stop times correctly. (P. 16) • Make sure VCR POWER button is pressed off. (P. 16) • Timer recording may not be performed or continued if a power interruption occurs before or during a Timer Recording, even after power is restored.
There is no playback picture, or the playback picture is noisy or contains streaks...	• Select channel 3 or 4 on TV to match VCR output channel (3 or 4) (P. 8) or select LINE. • Set VCR/TV selector to "VCR." • Adjust TRACKING control in either direction. (P. 37) • Try Head Cleaning. (P. 37)
Special effects playback, picture may contain some vertical jitter when using a TV with an Automatic Vertical Hold Control...	• Set TV's Vertical Hold Control to MANUAL, then adjust.
VCR cannot be controlled...	• Make sure VCR power is on. • Check Remote batteries. • Make sure VCR LOCK is set to off. (P. 33) • Make sure Remote is in proper mode. (P. 22) • Make sure Timer Record is not in progress.
Remote Control	**Correction**
VCR cannot be remote controlled...	• Make sure VCR power is on. • Make sure Remote is in VCR mode. • Aim Remote Control directly at remote sensor on VCR. (P. 6) • Avoid any object blocking signal path. • Check Remote batteries. (P. 4) • Make sure VCR LOCK is set to off. (P. 33) • Exposing VCR remote sensor to direct fluorescent or outdoor light may cause signal interference.
ACTION and PROG/VCR+ buttons do not respond...	• Check connections between VCR, external antenna, and TV. • Press VCR button for VCR mode. (P. 22) • Check Remote batteries. (P. 4)
Miscellaneous	**Correction**
Programs cannot be viewed on TV...	• Make sure TV power is on. • Make sure TV is set to output of VCR. • Check connections between VCR, external antenna, and TV. • Set VCR/TV selector to "TV." (P. 15) • Make sure proper signal source is selected.
Video cassette cannot be inserted...	• Insert the cassette with window side up; record tab facing you. • Check if a tape is already in the unit.
Video cassette cannot be removed...	• Completely insert Power Plug into an AC outlet.
Video cassette ejects when a recording is started or the power is turned off for timer recording...	• Make sure cassette record tab is intact. (P. 4)
In Stop mode, the motor (CYLINDER) continues to rotate...	• To enable Quick play mechanism, the cylinder will rotate for about 3 minutes. This reduces response time from Stop to Play mode and from Play to Rewind Search mode.

If you cannot resolve the problem, please call the Customer Call Center for product assistance at 1-800-211-PANA (7262).
To locate an authorized servicenter, please call toll free 1-800-211-PANA (7262).
or send e-mail to : consumerproducts@panasonic.com

Limited Warranty

Panasonic Consumer Electronics Company,
Division of Matsushita Electric Corporation of America,
One Panasonic Way
Secaucus, New Jersey 07094

Panasonic Sales Company, Division of
Matsushita Electric of Puerto Rico, Inc.
AVE. 65 de Infantería, Km. 9.5
San Gabriel Industrial Park Carolina,
Puerto Rico 00985

PANASONIC VHS VCR
Limited Warranty

Panasonic Consumer Electronics Company or Panasonic Sales Company (collectively referred to as "the Warrantor") will repair or replace this product with new or refurbished parts or equivalent product, free of charge in the USA or Puerto Rico, in the event of a defect in materials or workmanship as follows (all time periods commence from the date of the original purchase):

PARTS – ONE(1)YEAR
LABOR – NINETY(90)DAYS

Batteries – Non-rechargeable batteries are not warranted.
Tape (if included) – New video tape in exchange for defective video tape for five (5) days.

For assistance in the continental U.S.A. in obtaining repairs please ship the product to:
Panasonic Services Company
Customer Servicenter
Suite B
4900 George McVay Drive.
McAllen, TX 78503

In Puerto Rico contact the Panasonic Sales Company.
Tel. (787) 750-4300
Fax. (787)768-2910

When shipping the unit carefully pack and send it prepaid, adequately insured and preferably in the original carton. Include a letter detailing the complaint and provide a day time phone number where you can be reached.

IF REPAIR IS NEEDED DURING THE WARRANTY PERIOD THE PURCHASER WILL BE REQUIRED TO FURNISH A SALES RECEIPT/PROOF OF PURCHASE INDICATING DATE OF PURCHASE, AMOUNT PAID AND PLACE OF PURCHASE. CUSTOMER WILL BE CHARGED FOR THE REPAIR OF ANY UNIT RECEIVED WITHOUT SUCH PROOF OF PURCHASE.
Also, the purchaser will be responsible for shipping the unit to the above address.
This warranty is extended only to the original purchaser.

Limited Warranty continued on next page.

This warranty only covers failures due to defects in materials and workmanship which occur during normal use. The warranty does not cover damage which occurs in shipment, or failures which are caused by products not supplied by the warrantor, or failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, modification, faulty installation, set-up adjustments, improper antenna, inadequate signal pickup, improper insertion of consumables, maladjustment of consumer controls, improper operation, power line surge, improper voltage supply, lightning damage, commercial use such as hotel, office, restaurant, or other business or rental use of the product or service by anyone other than a **PANASONIC VHS VCR** authorized repair facility, or damage that is attributable to acts of God.

LIMITS AND EXCLUSIONS
There are no express warranties except as listed above.

THE WARRANTOR SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGE TO TAPES) RESULTING FROM THE USE OF THIS PRODUCTS, OR ARISING OUT OF ANY BREACH OF THE WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

If you have a problem with this product that is not handled to your satisfaction, then write to the Consumer Affairs Department at the Company address indicated on the previous page.

For Product Information, Operating Assistance, Literature Request, Dealer Locations, and all Customer Service inquiries please contact:
1-800-211-PANA (7262), Monday-Friday 9 am-9 pm Saturday-Sunday 9 am-7 pm, EST.

Web Site: http://www.panasonic.com
You can purchase parts, accessories or locate your nearest servicenter by visiting our Web Site.

Accessory Purchases:

1-800-332-5368 (Customer Orders Only)
Panasonic Services Company 20421 84th Avenue South, Kent, WA 98032
(6 am to 5 pm Monday - Friday; 6 am to 10:30 am Saturday; PST)
(Visa, MasterCard, Discover Card, American Express, Check)

Conexiones/Configuracion Inicial (READY TO PLAY)

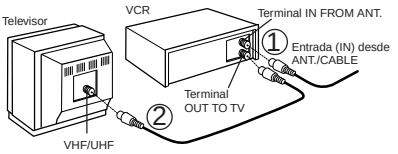
Favor realice la conexion de antena o cable antes de conectar el cordon de AC a la toma de pared. Conectando el cordon de AC de la VCR en toma de pared iniciara automaticamente la busqueda de canales y colocacion de tiempo.

Conectando

Para Ant/Cable ➔ VCR ➔ TV

① **Conecte Ant/Cable a la entrada de antena de la VCR (VCR In)**

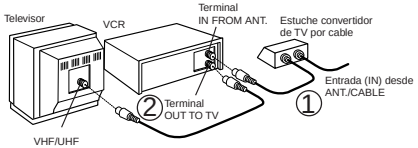
② **Conecte la salida de la VCR (VCR Out) a la entrada de antena de la TV (TV In) con el cable-accesorio RF incluido.**



Para Sistema Digital de Satelite (DSS)/ Convertidor de cable ➔ VCR ➔ TV

① **Conecte la salida del convertidor de cable a la "VCR In" con el RF cable accesorio incluido.**

② **Conecte "VCR Out" a la "TV In" con el cable-accesorio incluido.**



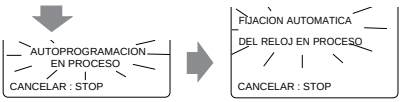
Realizando configuracion inicial

1 **Presione el boton VCR del control remoto para dicha modalidad. Encienda la TV y cambie a canal 3.**

2 **Conecte cordon de AC de la VCR a la toma de pared. La VCR se activara e iniciara busqueda de canales y colocacion de tiempo.**

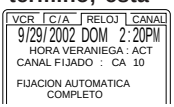
- **Si la pantalla abajo no aparece cheque la conexion VCR-TV y si la TV fue cambiada a el canal 3,trate cambiando a el canal 4.**
- **Para cambios a el canal de salida de la VCR favor hacer referencia a "VCR's Output Channel" (p. 19).**

Conectando cordon de AC a la toma de pared.



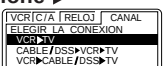
Si usa convertidor de cable solo enciendala y seleccione el canal PBS en su horario de uso u horario de zona. Si utiliza receptor DSS este debe estar apagado.

3 **Selecciones se realizaron automaticamente cuando la configuracion termino, esta pantalla aparece.**

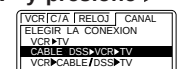


4 **SELECCION DE CONEXION en el menu desplegado en pantalla.**

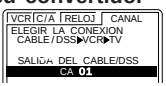
■ **(Si la conexion es ANT/CABLE➔VCR➔TV.)**
Presione ▲▼* para obtener las conexiones "VCR ▶ TV", o "VCR ▶ CABLE/DSS ▶ TV", y presione ▶ seleccionar.



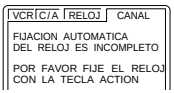
■ **(Si la conexion es DSS/Convertidor de cable➔VCR➔TV.)**
Presione ▲▼ para obtener la conexion "CABLE/DSS ▶ VCR ▶ TV" y presione ▶ para seleccionar.



Confirme el canal de salida de su convertidor de cable o receptor de DSS presione ▲▼ que permitiran selecionar el mismo canal de salida que su convertidor o DSS.
Presione ▶ para seleccion.



Si "FIJACION AUTOMATICA DEL RELOJ ES INCOMPLETO" aparece, coloque manualmente el tiempo, vealo abajo.



Realizando configuracion inicial

Si la colocacion de tiempo fue incompleta.

a **Presione la tecla ACTION en el control remoto para visualizar la pantalla del menú RELOJ.**

b **Presione ▲▼ para seleccionar el mes y ▶ para ajustar. De la misma forma, seleccione y ajuste la fecha, año, hora y DST (Hora de Verano).**

PRECAUCION
Si se sobre ajusta "NUT TYPE" el cable coaxial RF podria dañar las terminales de conexion. Ajusta ligeramente utiliza solo los dedos.

C **Presione dos veces la tecla ACTION para poner el RELOJ en marcha y pase al paso 4 anterior.**

***Importante:** Si un botón del control remoto no funciona al ser presionado, presione el botón VCR del control remoto y vuelva a intentarlo.

Operaciones básicas para la reproducción

1 **Inserte un cassette**,

2 **Presione PLAY** para reproducir el cassette.
- Si el cassette no tiene lengüeta de prevención de grabación (página 4), se inicia la reproducción automáticamente.

Detalles especiales durante la grabación

■ **Presione FF** o **REW** para búsqueda de escenas hacia delante/ hacia atrás. **Presione PLAY** para liberar.

Presione FF o **REW** para búsqueda de escenas Hacia delante/ Hacia atrás. **Presione PLAY** para liberar. Despues que la busqueda ha iniciado. **Presione FF** o **REW** en cada uno de los cambios de velocidades mostradas abajo.
[SLP] aprox. 43X ↔ aprox. 21X
[LP] aprox. 15X ↔ aprox. 9X
[SP] aprox. 13X ↔ aprox. 7X
Si a velocidad de 43X, 15X, o 13X la imagen se interrumpe cambie a velocidad 21X, 9X o 7X.

■ **Presione PAUSE/SLOW** para imagen Fija (Congelada). **Presione PLAY** para liberar.

■ **Presione PAUSE/SLOW** en el modo de imagen fija para imágenes cuadro a cuadro. **Presione PLAY** para liberar.

■ Mantenga **presionado PAUSE/SLOW** en el modo de imagen fija para imágenes en cámara lenta. **Presione PLAY** para liberar.

3 **Presione STOP** para detener el cassette.

■ **Presione REW** o **FF** en el modo de parada para rebobinado/avance rápido del cassette.

■ **Presione EJECT** en el control remoto, o **STOP/EJECT** en el VCR para expulsar la cassette.

Operaciones básicas para la grabación

1 **Inserte el cassette con lengüeta de protección de grabación (pág. 4).**

2 **Presione CH ▲▼,** o **las teclas de números** para seleccionar el canal.

3 **Presione SPEED** para seleccionar la velocidad de grabación (pág.4)
- SP = Reproducción estándar,
- LP = Larga duración,
- SLP = Superlarga duración.

4 **Presione REC** para comenzar a grabar.
- Para eliminar escenas indeseadas, **presione PAUSE/SLOW** para pausar, y al presionar nuevamente se reanuda la grabación.
- No podrá ver otro canal durante la grabación.

5 **Presione STOP** para detener la grabación

■ **Grabación de Un Toque** (grabar en marcha),
- El VCR se apaga después de preajustar la extensión de la grabación.
  ➛ Cada vez que se **presiona REC** se añaden 30 min. a la extensión de grabación hasta un máximo de 4 horas.

Programación fácil para la grabación con temporizador

1 **Presione PROG/VCR+** para visualizar PROGRAM.

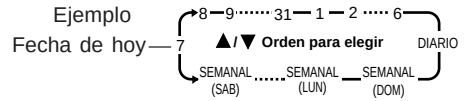
2

Presione ▼ para visualizar la pantalla de Programación.

3

1) Para ajustar la FECHA de grabación, presione ▲▼ para seleccionar:
1-31 = una vez, o
DIARIO = a la misma hora de lunes a viernes, o SEMANA = a la misma hora cada semana y **presione ▶** para ajustar.

Orden para elegir

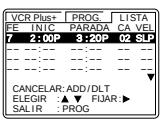


2) Para ajustar los ítems que quedan, presione ▲▼ para seleccionar y **presione ▶** para ajustar los tiempos de INICIO/PARADA, CANAL, o entrada de LÍNEA (pág. 36), CATEGORIA**, y velocidad del cassette (SP, LP, SLP).

Presione PROG/VCR+ para finalizar el programa.

**Categoría
NO, DEPORTE, CINE, COMEDIA, MUSICA, DRAMA

4



Presione ▲▼ para seleccionar un número que no está usando para ingresar mas programas y **presione ▶** para ajustar. Luego repita el paso 3.

Presione nuevamente PROG/VCR+ para salir.

5 **Presione POWER off** para ajustar el temporizador.
(Se ilumina "TIMER" en el panel delantero)

Guía para rápida consulta

Index

A
Accessories 4
AC Power Plug 7
Add or Delete a Channel 13
Audio Input Connector (L/R) 7
Audio Output Connector (L/R) 7
Audio/Video Connection 24
Auto Operation Functions 31
Auto Shut-Off 35
Auto VCR Plus+ System Channel Setup 18, 19

B
Batteries 4
Before Requesting Service 39
Blank Tape/ No Video Signal Indications 38

C
Cable Box Setup 10
Cassette Compartment 6
Channel Caption 32
Channel Up/Down Tracking/ V-Lock Button 6
Cleaning the VCR 37
Clock/Status/Channel/Speed Display 7
Commercial Advance 26, 27, 28
Connections 8, 10, 24
Copying Your Tapes 36

D
DST (Daylight Saving Time) 13

F
Fast Forward/Search Button 6
Features for a Quality Picture 37
Function & Channel Displays 38

H
Head Cleaning 37
Hi-Fi Indicator 7

I
Important Safeguards and Precautions 2
Index Search 30
Initial Setup 8, 9, 10, 11

L
Limited Warranty 40, 41

M
Manual VCR Plus+ System Channel Setup 20
Movie Advance 29
MTS Broadcast 25
Multi-Brand Control 22, 23

O
On-Screen Display 38

P
Playback 14
Play Button 6
Power Button 6
Power Indicator 7
Program End Search 30

R
Record 15
Record Button 6
Remote Control Buttons 6
Remote Sensor 6
Remote Warning ON/OFF 33
Repeat Play 31
Reset Language, Channels, Clock, VCR's Output Channel 12, 13
Review,Replace or Clear Program Contents 17
Rewind/Search Button 6

S
Select Audio Mode 25
Shuttle Variable Speed Search 35
Spanish Quick Use Guide 42, 43
Specifications 37
Stereo/SAP/Mono Broadcast 25
Stop/Eject Button 6

T
Table of Contents 5
Tape Position and Tape Status 34
Time Stamp 34
Timer Indicator 7
Timer Recording 16, 17

V
VCR Indicator 7
VCR Lock 33
VCR Plus+ System Programming 21
VCR Status & Clock Displays 38
VCR/TV Selector 6, 35
VHF/UHF Antenna Input Terminal 7
VHF/UHF Antenna Output Terminal 7
Video Input Connector (L/R) 7
Video Output Connector (L/R) 7

W
Warning and Instruction Displays 38
Weak Signal Display ON/OFF 35

Z
Zero Search 31

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P

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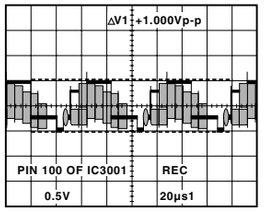
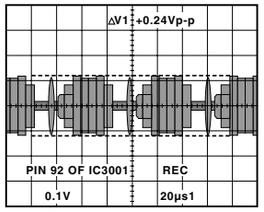
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART
OF MODELS & MARKS

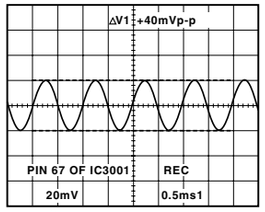
MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G



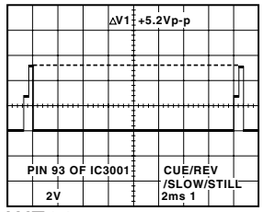
WF1



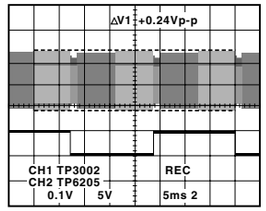
WF6



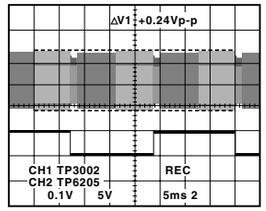
WF9



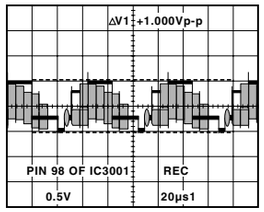
WF14



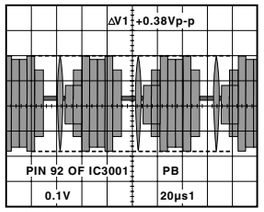
CH1 WF17 (A)
CH2 WF21 (A)



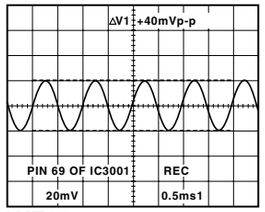
CH1 WF17 (B,C,D,E,F,G)
CH2 WF21 (B,C,D,E,F,G)



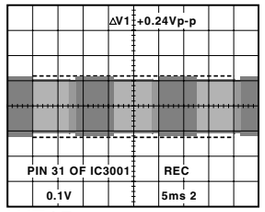
WF2



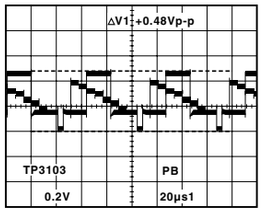
WF6



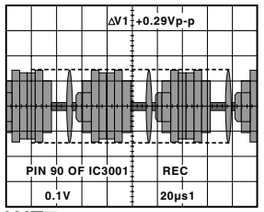
WF10



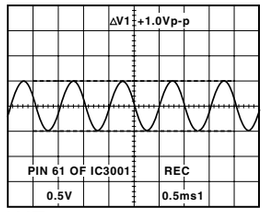
WF15



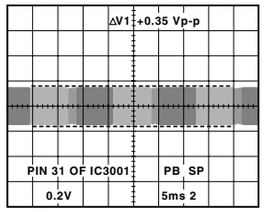
WF3



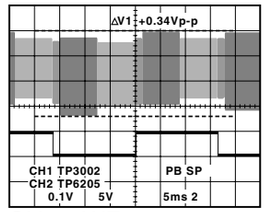
WF7



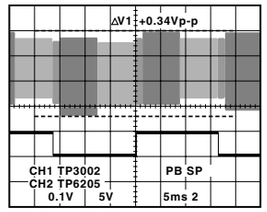
WF11



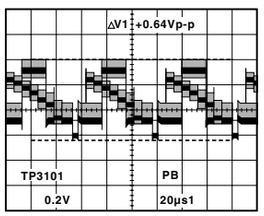
WF15



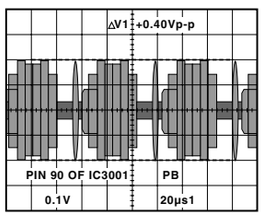
CH1 WF17 (A)
CH2 WF21 (A)



CH1 WF17 (B,C,D,E,F,G)
CH2 WF21 (B,C,D,E,F,G)



WF4



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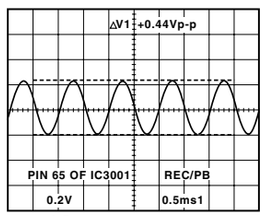
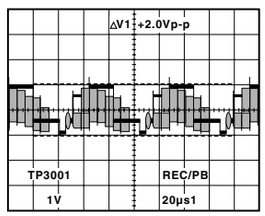
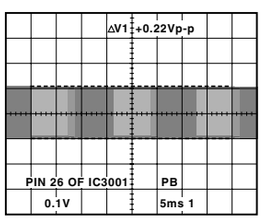


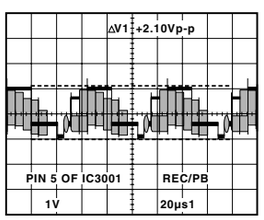
WF12



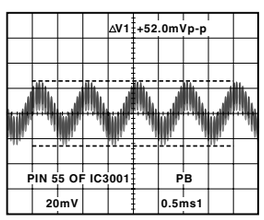
WF16



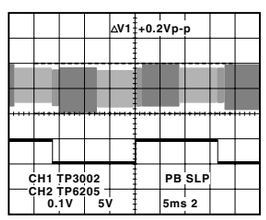
WF5



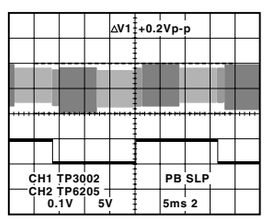
WF8



WF13



CH1 WF17 (A)
CH2 WF21 (A)



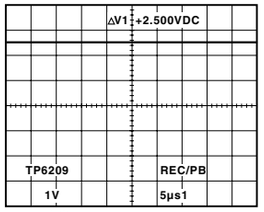
CH1 WF17 (B,C,D,E,F,G)
CH2 WF21 (B,C,D,E,F,G)

WAVE FORM
PV-V4022-K/PV-V4522-K/PV-V462/PV-V4602/PV-V4612S
/PV-V4612-K/PV-V4622

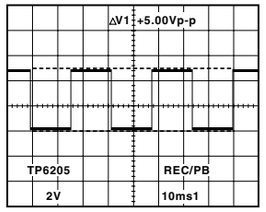
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART
OF MODELS & MARKS

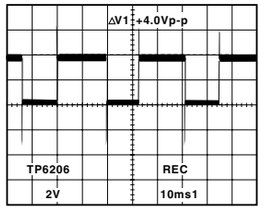
MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G



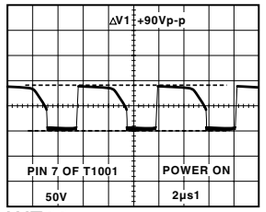
WF18



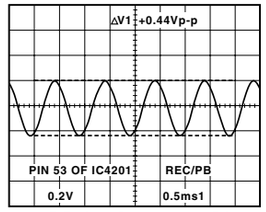
WF21



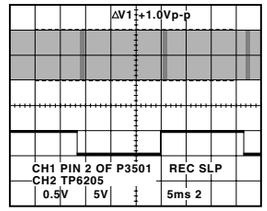
WF24



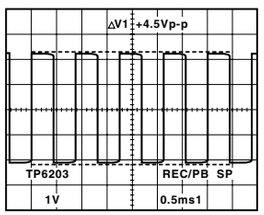
WF28



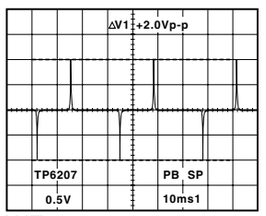
WF33 (B,C,D,E,F,G)



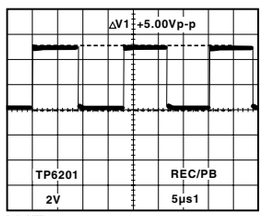
CH1 WF37
CH2 WF21



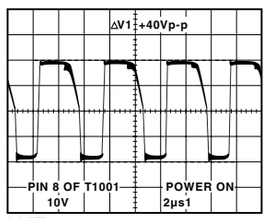
WF19



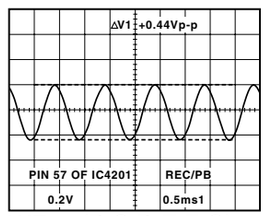
WF22



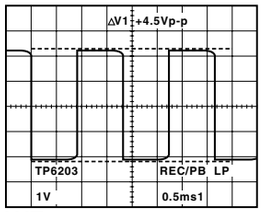
WF25



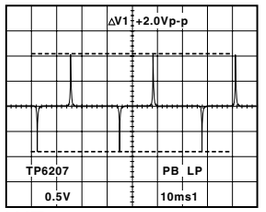
WF29



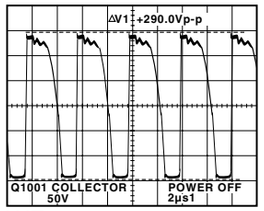
WF34 (B,C,D,E,F,G)



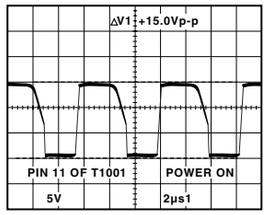
WF19



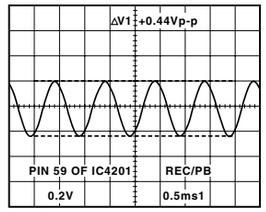
WF22



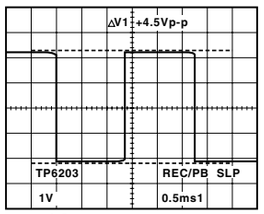
WF26



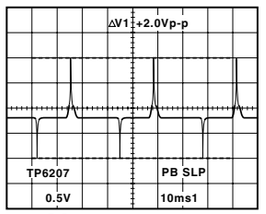
WF30



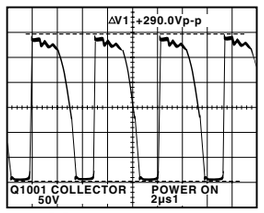
WF35 (B,C,D,E,F,G)



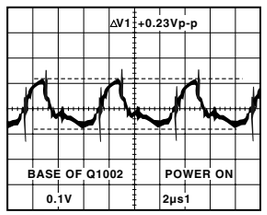
WF19



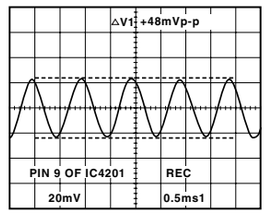
WF22



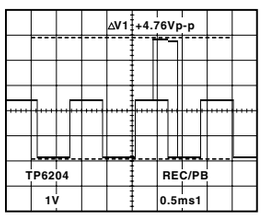
WF26



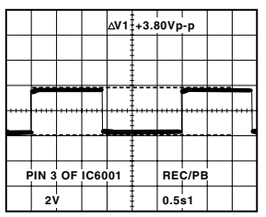
WF31



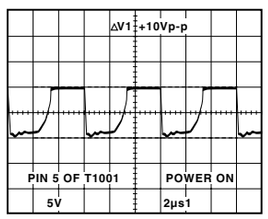
WF36 (B,C,D,E,F,G)



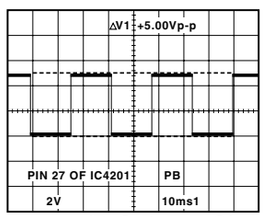
WF20



WF23



WF27



WF32 (B,C,D,E,F,G)

WAVE FORM
PV-V4022-K/PV-V4522-K/PV-V462/PV-V4602/PV-V4612S
/PV-V4612-K/PV-V4622

❶ MECHANISM (TOP) SECTION

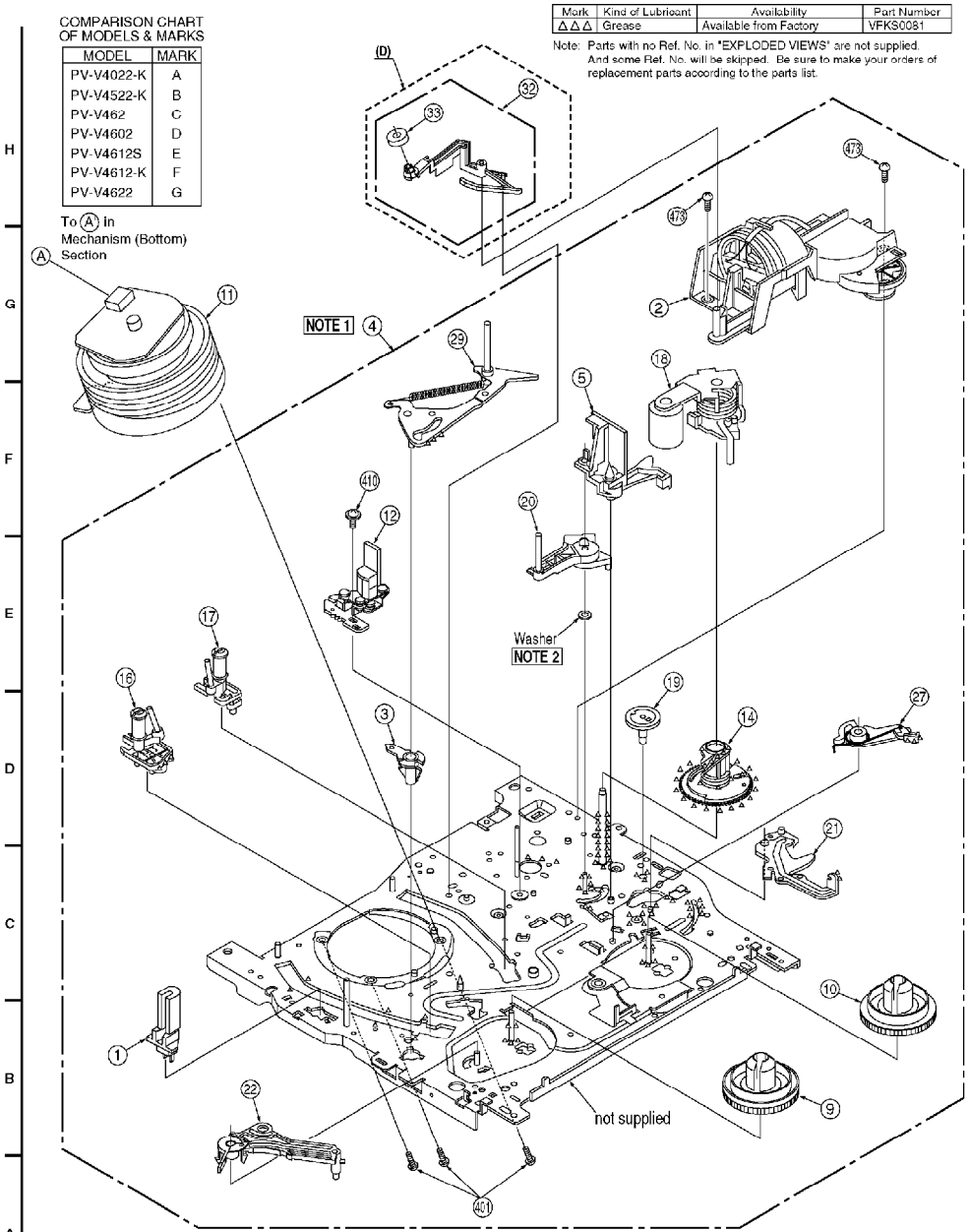
LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
△△△	Grease	Available from Factory	VFKS0081

Note: Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied. And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G



NOTE 1: The Mechanical Chassis Sub Ass'y (Ref. No. 4) consists of all the mechanical parts except the Cylinder Unit (Ref. No. 11) and the Cassette Up Ass'y (Ref. No. 61). After replacing the Mechanical Chassis Sub Ass'y, be sure to perform "TAPE INTERCHANGEABILITY ADJUSTMENT" in MECHANICAL ADJUSTMENT procedures.

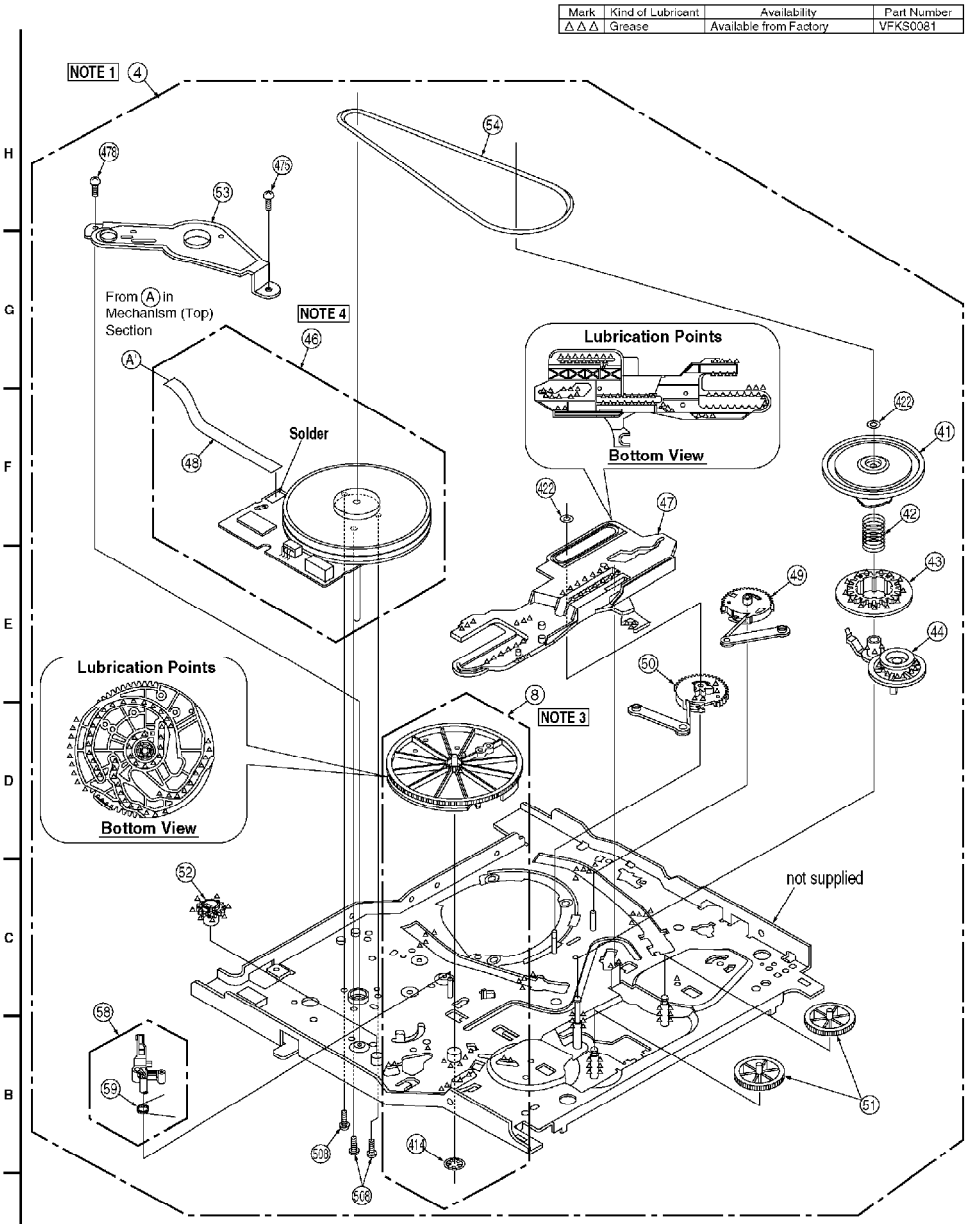
NOTE 2: In early units, a washer is used. When servicing the washer or the P5 Arm Unit, replace only the P5 Arm Unit with a new one, and remove the washer.

10.2. MECHANISM (BOTTOM) SECTION

❷ MECHANISM (BOTTOM) SECTION

LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
△△△	Grease	Available from Factory	VFKS0081



NOTE 1: The Mechanical Chassis Sub Ass'y (Ref. No. 4) consists of all the mechanical parts except the Cylinder Unit (Ref. No. 11) and the Cassette Up Ass'y (Ref. No. 61). After replacing the Mechanical Chassis Sub Ass'y, be sure to perform "TAPE INTERCHANGEABILITY ADJUSTMENT" in MECHANICAL ADJUSTMENT procedures.

NOTE 3: Main Cam Gear is supplied as a Main Cam Gear Kit only. Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut. However, Main Cam Push Nut is available separately as a replacement part.

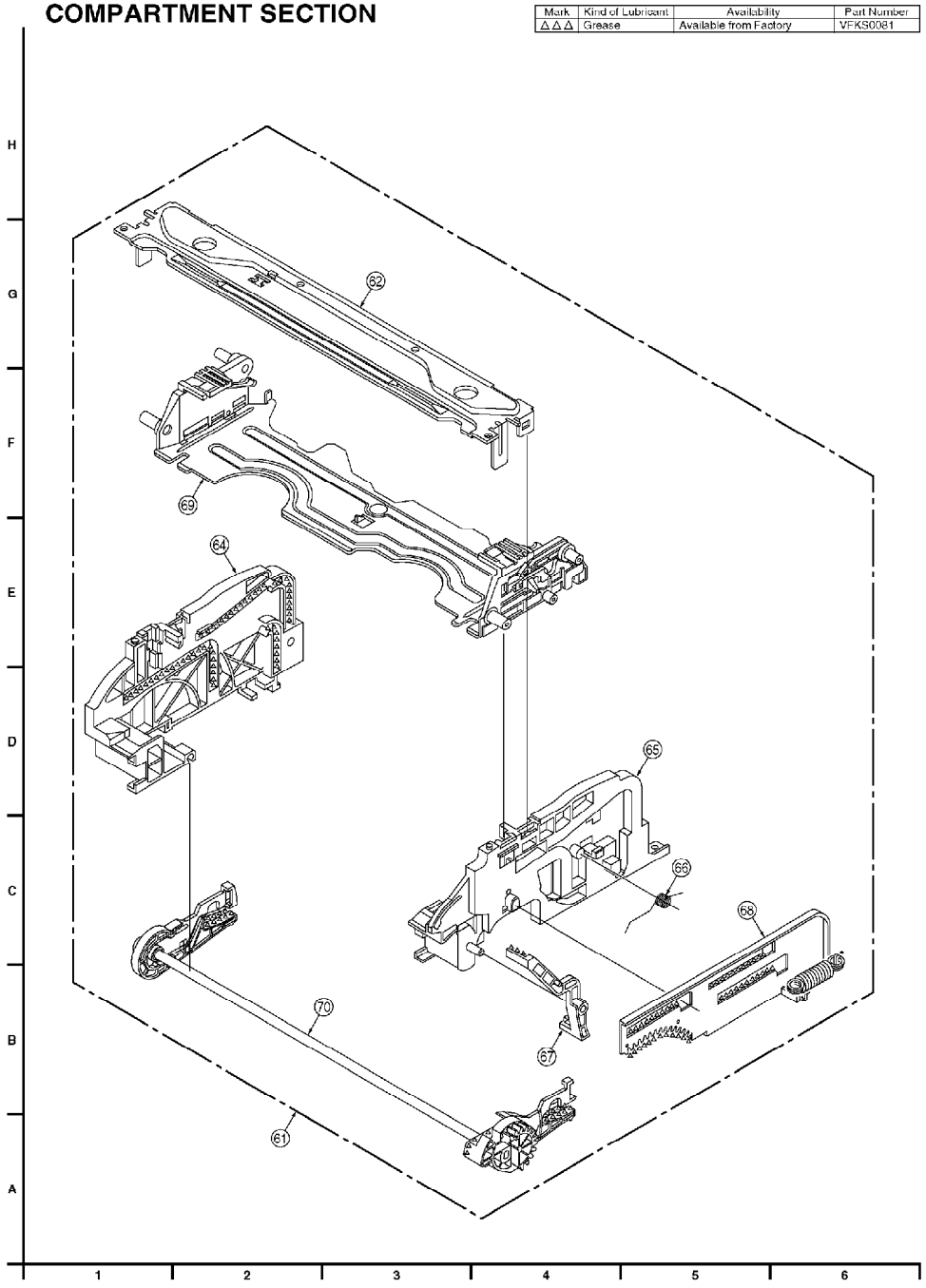
NOTE 4: The Capstan Motor Ass'y (Ref. No. 46) is supplied as a unit only. However, the Flat Flexible Cable (Ref. No. 48) is available separately as a replacement part.

10.3. CASSETTE UP COMPARTMENT SECTION

❸ CASSETTE UP COMPARTMENT SECTION

LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
△△△	Grease	Available from Factory	VFKS0081



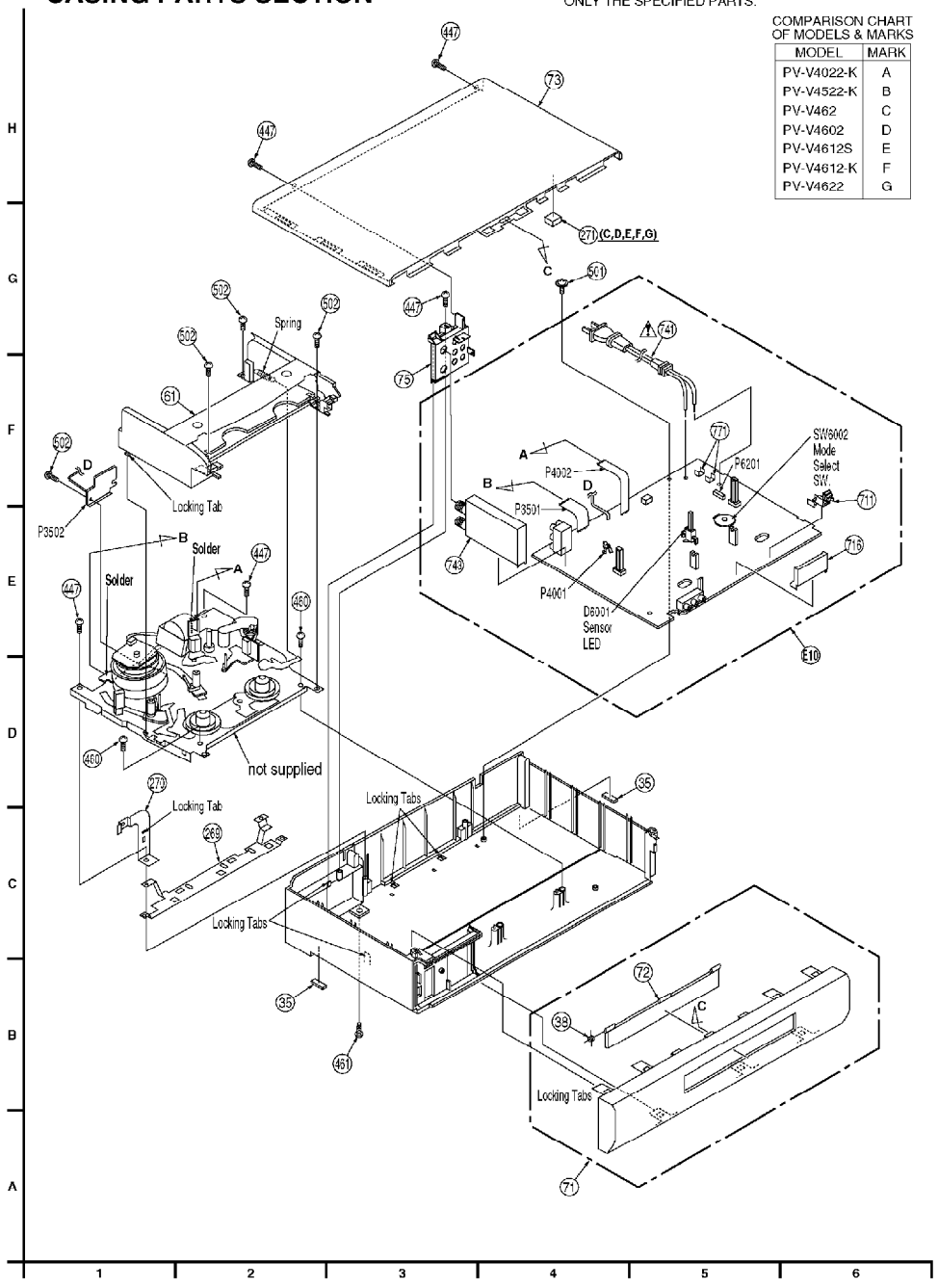
10.4. CHASSIS FRAME AND CASING PARTS SECTION

❹ CHASSIS FRAME AND CASING PARTS SECTION

IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

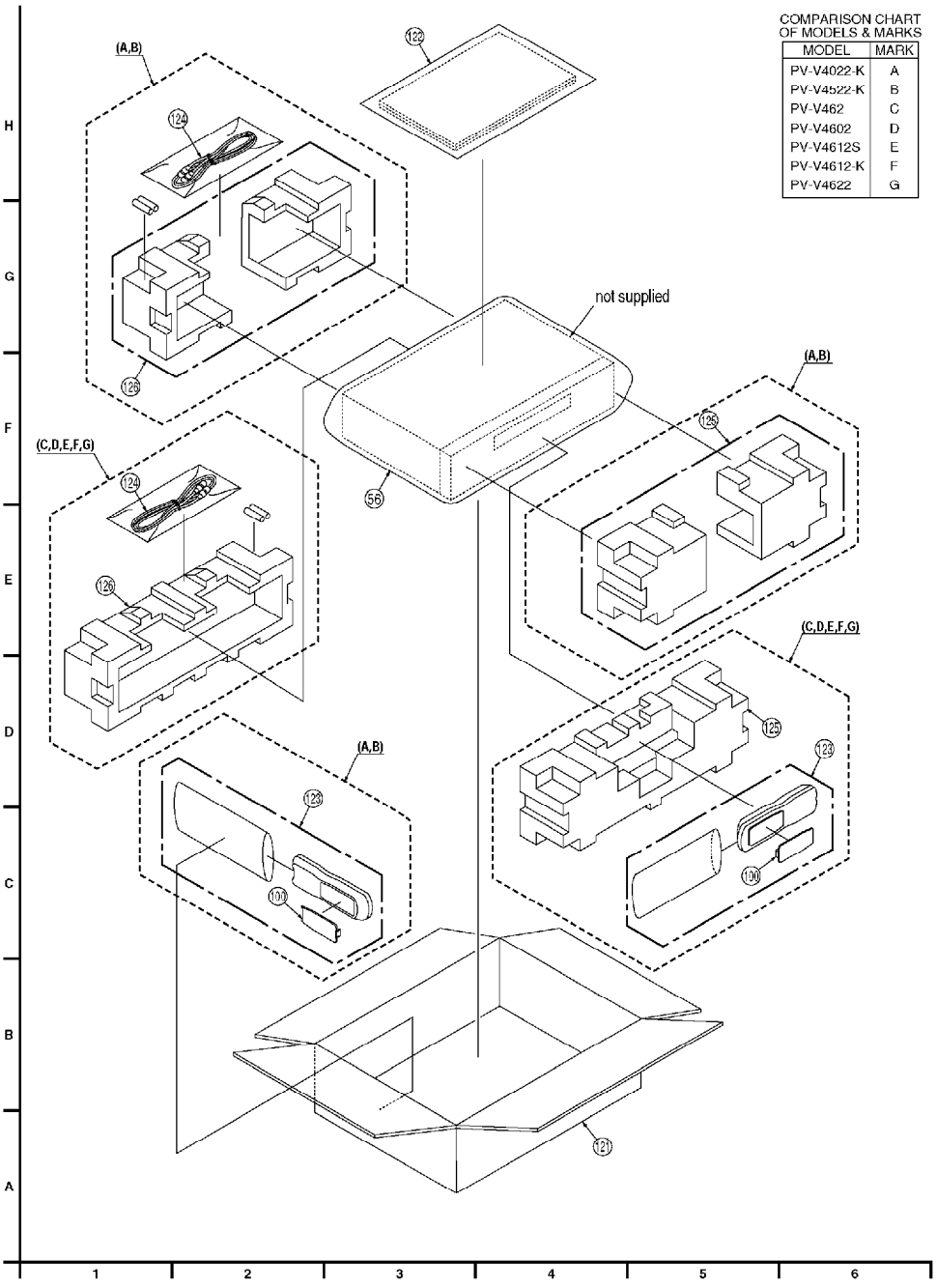
COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V4022-K	A
PV-V4522-K	B
PV-V462	C
PV-V4602	D
PV-V4612S	E
PV-V4612-K	F
PV-V4622	G



10.5. PACKING PARTS AND ACCESSORIES SECTION

❺ PACKING PARTS AND ACCESSORIES SECTION



11. REPLACEMENT PARTS LISTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

11.1. REPLACEMENT NOTES

11.1.1. General Notes

1. Use only original replacement parts:

To maintain original function and reliability of repaired units, use

only original replacement parts which are listed with their part numbers in the parts list.

2. IMPORTANT SAFETY NOTICE
   Components identified by the sign ⚠ have special characteristics important for safety. When replacing any of these components, use only the specified parts.
3. SPECIAL NOTE
   All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.
4. Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied. And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.
5. Parts different in shape or size may be used. However, only interchangeable parts will be supplied as service replacement parts.
6. All of parts are supplied from MKI.
7. Item numbers with capital letter E (Example: E10, E20, ...) in the Ref. No. column are shown in the exploded views.
8. Parts whose Ref. Nos. are the same are interchangeable as replacement parts. Any of these parts may be ordered and used as a replacement part.

11.1.2. Mechanical Replacement Notes

1. Section No. of parts shown in Exploded Views are indicated in the Remarks column.
2. The Mechanical Chassis Sub Ass'y (Ref. No. 4) consists of all the mechanical parts except the Cylinder Unit (Ref. No. 11) and the Cassette Up Ass'y (Ref. No. 61).
   After replacing the Mechanical Chassis Sub Ass'y, be sure to perform "TAPE INTERCHANGEABILITY ADJUSTMENT" in MECHANICAL ADJUSTMENT procedures.
3. In early units, a washer is used.

When servicing the washer or the P5 Arm Unit, replace only the P5 Arm Unit with a new one, and remove the washer.

4. Main Cam Gear is supplied as a Main Cam Gear Kit (Ref. No. 8) only. Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut. However, Main Cam Push Nut is available separately as a replacement part.
5. The Capstan Motor Ass'y (Ref. No. 46) is supplied as a unit only. However, the Flat Flexible Cable (Ref. No. 48) is available separately as a replacement part.
6. The Infrared Remote Control Unit (Ref. No. 123) replacement part is available as a complete assembly unit only. Do not try to disassemble the Infrared Remote Control Unit. However, the battery cover is available separately as areplacement part.
7. Main Cam Push Nut (Ref. No. 414) is not reusable.
   If removed, install a new one.

11.1.3. Electrical Replacement Notes

1. Unless otherwise specified;
   All resistors are in Ω, K = 1,000 Ω, M = 1,000 k Ω.
2. Abbreviation

RTL:
Retention Time Limited
This indicates that the retention time is limited for this item. After the discontinuation of this item in production, it will no longer be available.

NR:
Non Repairable Board Ass'y

MGF CHIP:
Metal Glaze Film Chip

C CHIP:
Ceramic Chip

COMPLX CMP:
Complex Component

W FLMPRF:

Wirewound Flameproof

C.B.A.:
Circuit Board Assembly

P.C.B.:
Printed Circuit Board

E.S.D.:
Electrostatically Sensitive Devices

3. **When replacing 0 Ω resistor, a wire can be substituted for it.**
4. **Since the UHF/VHF TUNER/TV DEMODULATOR UNIT (Ref. No. 743) has already been pre-adjusted at the factory, do not try to adjust the UHF/VHF TUNER/TV DEMODULATOR UNIT. The UHF/ VHF TUNER/TV DEMODULATORUNIT replacement part is available as a complete assembly unit only.**
5. **EEP ROM IC (IC6005), MAIN C.B.A. replacement note:**
   After replacing EEP ROM IC (IC6005) or MAIN C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.
6. **Microcontroller IC (IC6001) and EEP ROM IC (IC6005) replacement note for PV-V4022-K, and PV-V4522-K:**
   In early units, MN101D06FPK is used for Microcontroller IC (IC6001). In later units, MN101D09EPA is used for Microcontroller IC (IC6001).
   Please note that only MN101D09EPA is supplied as a replacement part for Microcontroller IC (IC6001) and this can be used with both types of EEP ROM IC (IC6005).
   When replacing EEP ROM IC (IC6005), be sure to confirm which type of Microcontroller IC (IC6001) is used on the unit you are servicing and install the proper part for EEP ROM IC (IC6005).

	Microcontroller IC (IC6001)	EEP ROM IC (IC6005)
Early Unit	MN101D06FPK	LSEQ0642
Later Unit	MN101D09EPA	KS24C011CS or AT24C01A10SI or C0ZBZ0000015 or C3EBCC000038 or KS24C011IS or M24C01-MN6

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PV-V4022-K	A	PV-V4612S	E
PV-V4522-K	B	PV-V4612-K	F
PV-V462	C	PV-V4622	G
PV-V4602	D		

11.2. MECHANICAL REPLACEMENT PARTS LIST

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PV-V4022-K	A	PV-V4612S	E
PV-V4522-K	B	PV-V4612-K	F
PV-V462	C	PV-V4622	G
PV-V4602	D		

MECHANICAL REPLACEMENT PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	VBSS0033	FULL ERASE HEAD	1
2	LSXK0094	MOTOR BLOCK UNIT	1
3	LSDB0045	TENSION ARM BOSS	1
4	LSXY0278	MECHANICAL CHASSIS SUB ASS'Y (A)	1,2
4	LSXY0279	MECHANICAL CHASSIS SUB ASS'Y (B,C,D,E,F)	1,2
4	LSXY0280	MECHANICAL CHASSIS SUB ASS'Y (G)	1,2
5	LSMD0209	OPENER PIECE	1
8	VVGS0009	MAIN CAM GEAR KIT	2
9	LSDR0004	S REEL TABLE (A,B,C,D,E,F)	1
9	LSDR0006	S REEL TABLE (G)	1
10	LSDR0005	T REEL TABLE (A,B,C,D,E,F)	1
10	LSDR0007	T REEL TABLE (G)	1
11	LSEG0014	CYLINDER UNIT (A)	1
11	LSEG0015	CYLINDER UNIT (B,C,D,E,F,G)	1
12	VEHS0596	AUDIO CONTROL/ERASE HEAD UNIT (A,G)	1
12	VEHS0598	AUDIO CONTROL/ERASE HEAD UNIT (B,C,D,E,F)	1
14	LSDG0112	LIFT GEAR	1
16	VXDS0213	LOADING POST BASE-S UNIT	1
17	VXDS0214	LOADING POST BASE-T UNIT	1
18	LSXL0079	PINCH ARM UNIT	1
19	LSDG0110	INTERMEDIATE GEAR A	1
20	LSXL0078	P5 ARM UNIT	1
21	LSML0131	DRIVE RACK ARM	1
22	LSXL0077	TENSION CONTROL ARM UNIT	1
27	VXLS1130	T BRAKE UNIT	1
29	VXLS1129	TENSION ARM UNIT	1
32	VXLS1104	CLEANER ARM UNIT (D)	1
33	VDPS0269	CLEANER ROLLER (D)	1
35	LSKA0012	RUBBER FOOT	4
38	VMBS1161	CASSETTE DOOR SPRING	4
41	VXPS0389	CENTER CLUTCH UNIT	2
42	VMBS1151	CHANGING GEAR SPRING	2
43	LSDG0114	CHANGING GEAR (A,B,C,D,E,F)	2
43	LSDG0132	CHANGING GEAR (G)	2
44	VXLS1091	IDLER ARM UNIT (A,B,C,D,E,F)	2
44	VXLS1133	IDLER ARM UNIT (G)	2

Ref. No.	Part No.	Part Name & Description	Remarks
46	LSEM0056	CAPSTAN MOTOR ASS'Y (A,B,C,D,E,F)	2
46	LSEM0058	CAPSTAN MOTOR ASS'Y (G)	2
47	LSMM0003	MAIN ROD (A,B,C,D,E,F)	2
47	LSMM0004	MAIN ROD (G)	2
48	LSJW0027	FLEXIBLE FLAT CABLE W/OUT PLUG	2
49	VXLS1099	S LOADING ARM UNIT	2
50	VXLS1098	T LOADING ARM UNIT	2
51	LSDG0116	REEL GEAR (A,B,C,D,E,F)	2
51	LSDG0134	REEL GEAR (G)	2
52	LSDG0111	INTERMEDIATE GEAR B	2
53	LSMA0532	SUPPORT ANGLE	2
54	LSDV0009	CAPSTAN BELT SQUARE,ELASTOMER 2MM	2
56	LSPF0056	SHEET,POLYETHYLENE	5
58	LSXL0081	SS BRAKE ARM UNIT	2
59	LSMB0196	SS BRAKE SPRING	2
61	VXYS1347	CASSETTE UP ASS'Y	3,4
62	LSMA0352	TOP PLATE	3
64	LSMD0174	SIDE PLATE L	3
65	LSMD0173	SIDE PLATE R	3
66	LSMB0218	SUPPORT SPRING	3
67	LSML0096	OPENER LEVER	3
68	VXLS1111	DRIVE RACK UNIT	3
69	VXAS4423	HOLDER UNIT	3
70	VXLS1110	WIPER ARM UNIT	3
71	VYPS7118	FRONT PANEL ASS'Y (A)	4
71	VYPS7117	FRONT PANEL ASS'Y (B)	4
71	VYPS7138	FRONT PANEL ASS'Y (C)	4
71	VYPS7137	FRONT PANEL ASS'Y (D)	4
71	VYPS7139	FRONT PANEL ASS7Y (E)	4
71	VYPS7115	FRONT PANEL ASS'Y (F)	4
71	VYPS7116	FRONT PANEL ASS'Y (G)	4
72	VYPS7112	CASSETTE DOOR-LID UNIT (A)	4
72	VYPS7113	CASSETTE DOOR-LID UNIT (B,C,F)	4
72	VYPS7085	CASSETTE DOOR-LID UNIT (D)	4
72	VYPS7120	CASSETTE DOOR-LID UNIT (E,G)	4
73	LSKM0521	TOP COVER (A,B)	4
73	LSKM0559	TOP COVER (C,D,F)	4
73	LSKM0579	TOP COVER (E,G)	4
75	LSGP0244	REAR PANEL (A)	4
75	LSGP0243	REAR PANEL (B,C,D,E,F,G)	4
100	LSKF0322	BATTERY COVER (A)	5
100	VKFS2235	BATTERY COVER (B,C,D,F)	5
100	LSKF0369	BATTERY COVER (E)	5
100	LSKF0458	BATTERY COVER (G)	5
121	LSPG1217	PACKING CASE,PAPER (A)	5
121	LSPG1218	PACKING CASE,PAPER (B)	5
121	LSPG1305	PACKING CASE,PAPER (C)	5
121	LSPG1266	PACKING CASE,PAPER (D)	5
121	LSPG1306	PACKING CASE,PAPER (E)	5
121	LSPG1220	PACKING CASE,PAPER (F)	5
121	LSPG1215	PACKING CASE,PAPER (G)	5
122	LSQF0536	FAN BAG (A,B)	5
122	LSQF0576	FAN BAG (C)	5
122	LSQF0534	FAN BAG (D)	5

Ref. No.	Part No.	Part Name & Description	Remarks
122	LSQF0578	FAN BAG (E)	5
122	LSQF0538	FAN BAG (F)	5
122	LSQF0509	FAN BAG (G)	5
123	LSSQ0263	INFRARED REMOTE CONTROL UNIT (A)	5
123	LSSQ0290	INFRARED REMOTE CONTROL UNIT (B)	5
123	LSSQ0342	INFRARED REMOTE CONTROL UNIT (C)	5
123	LSSQ0300	INFRARED REMOTE CONTROL UNIT (D)	5
123	LSSQ0343	INFRARED REMOTE CONTROL UNIT (E)	5
123	LSSQ0313	INFRARED REMOTE CONTROL UNIT (F)	5
123	LSSQ0314	INFRARED REMOTE CONTROL UNIT (G)	5
124	LSJA0372	VHF CONNECTING CABLE W/PLUG,0V	5
124	LSJA0274	VHF CONNECTING CABLE W/PLUG,0V	5
124	LSJA0328	VHF CONNECTING CABLE W/PLUG,0V	5
124	VJAS0212	VHF CONNECTING CABLE W/PLUG,0V	5
125	LSPN0209	FRONT CUSHION,STYROFOAM (A)	5
125	LSPN0230	FRONT CUSHION,STYROFOAM (B)	5
125	LSPN0169	FRONT CUSHION,STYROFOAM (C,D,E,F,G)	5
126	LSPN0210	REAR CUSHION,STYROFOAM (A)	5
126	LSPN0231	REAR CUSHION,STYROFOAM (B)	5
126	LSPN0152	REAR CUSHION,STYROFOAM (C,D,E,F,G)	5
269	LSSC0425	GROUNDING PLATE	4
270	LSSC0426	GROUNDING PLATE	4
271	LSGQ0041	CUSHION,PLASTIC (C,D,E,F,G)	4
401	VHDS0475	SCREW,STEEL	1
410	VHDS0498	SCREW W/WASHER,STEEL	1
414	VHNS0070	MAIN CAM PUSH NUT,STEEL	2
422	XWGV2D5G	WASHER,NYLON	2
447	VHDS0310	SCREW,STEEL	4
460	XTN4+12A	TAPPING SCREW,STEEL	4
461	VHDS0460	SCREW,STEEL	4
473	XYN26+C6	SCREW W/WASHER,STEEL	1
475	XTV26+5FJ	TAPPING SCREW,STEEL	2
478	VHDS0495	SCREW,STEEL	2
501	LSHD0074	SCREW,STEEL	4
502	LSHD0075	TAPPING SCREW,STEEL	4
508	XTB26+6J	TAPPING SCREW,STEEL	2
711	LSSZ0004	INFRARED RECEIVER UNIT	4
716	B3CKS0000001	LED DISPLAY PANEL	4
741	LSJA0360	AC CORD W/PLUG,AC 120V	4 ⚠
741	LSJA0358	AC CORD W/PLUG,AC 120V	4 ⚠
741	LSJA0359	AC CORD W/PLUG,AC 120V	4 ⚠
741	LSJA0361	AC CORD W/PLUG,AC 120V	4 ⚠
741	LSJA0348	AC CORD W/PLUG,AC 120V	4 ⚠
743	ENG56717G1	TUNER,UHF/VHF NR (A,B,E,F)	4
743	ENG56717G1L	TUNER,UHF/VHF NR (C,D,G)	4
771	EYF52BC	FUSE HOLDER	4
E10	LSEP2006GA	MAIN C.B.A. (A)	4 RTL
E10	LSEP2006HA	MAIN C.B.A. (B)	4 RTL
E10	LSEP2006HH	MAIN C.B.A. (C)	4 RTL
E10	LSEP2006HF	MAIN C.B.A. (D)	4 RTL
E10	LSEP2006HC	MAIN C.B.A. (E,F)	4 RTL
E10	LSEP2006HD	MAIN C.B.A. (G)	4 RTL

SERVICE FIXTURES AND TOOLS

Ref. No.	Part No.	Part Name & Description	Remarks
	VFMS0003H6	VHS ALIGNMENT TAPE	
	VFKS0081	GREASE	
	VFK0329	POST ADJUSTMENT DRIVER	
	VFK27	HEAD CLEANING STICK	
	VFK0330	H-POSITION ADJUSTMENT DRIVER	

11.3. ELECTRICAL REPLACEMENT PARTS LIST

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PV-V4022-K	A	PV-V4612S	E
PV-V4522-K	B	PV-V4612-K	F
PV-V462	C	PV-V4622	G
PV-V4602	D		

PRINTED CIRCUIT BOARD ASSEMBLY

Ref. No.	Part No.	Part Name & Description	Remarks
E10	LSEP2006GA	MAIN C.B.A. (A)	E.S.D. RTL
E10	LSEP2006HA	MAIN C.B.A. (B)	E.S.D. RTL
E10	LSEP2006HH	MAIN C.B.A. (C)	E.S.D. RTL
E10	LSEP2006HF	MAIN C.B.A. (D)	E.S.D. RTL
E10	LSEP2006HC	MAIN C.B.A. (E,F)	E.S.D. RTL
E10	LSEP2006HD	MAIN C.B.A. (G)	E.S.D. RTL

11.3.1. MAIN C.B.A.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK	MODEL	MARK
PV-V4022-K	A	PV-V4612S	E
PV-V4522-K	B	PV-V4612-K	F
PV-V462	C	PV-V4622	G
PV-V4602	D		

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description	Remarks
IC1001	0N3131-R.KT	IC, LINEAR	⚠
IC1001	PS2501-1-X	IC, LINEAR	⚠
IC1001	0N3131-S.KT	IC, LINEAR	⚠
IC1002	TA76431ASTP6	IC, LINEAR	
IC1002	C0DAEMZ00001	IC, LINEAR	
IC3001	NN13400A	IC, LINEAR	
IC3101	MN3885S	IC, LINEAR	
IC3801	AN3275SB-E1	IC, LINEAR (E,F,G)	
IC4151	C0JBAR000292	IC, CMOS STANDARD LOGIC (A)	E.S.D.
IC4151	CD4053BCM	IC, CMOS STANDARD LOGIC (A)	E.S.D.
IC4151	C0JBAR000338	IC, CMOS STANDARD LOGIC (A)	E.S.D.
IC4201	AN3663FBP-V	IC, LINEAR (B,C,D,E,F,G)	
IC6001	MN101D09EPA	IC, 8BIT MICROCONTROLLER (A,B) *See Replacement Note	E.S.D.
IC6001	MN101D06FPL	IC, 8BIT MICROCONTROLLER (C,E,F)	E.S.D.
IC6001	MN101D06GPN	IC, 8BIT MICROCONTROLLER (D)	E.S.D.
IC6001	MN101D06GPM	IC, 8BIT MICROCONTROLLER (G)	E.S.D.
IC6002	B3NAA0000049	PHOTO INTERRUPUTER	
IC6003	B3NAA0000049	PHOTO INTERRUPUTER	
IC6004	C0EBJ0000080	IC, CMOS STANDARD LOGIC	E.S.D.
IC6004	C0EBJ0000099	IC, CMOS STADNARD LOGIC	E.S.D.
IC6004	RN5VS47CA-TR	IC, CMOS STADNARD LOGIC	E.S.D.
IC6005	LSEQ0642	IC, 1K EEP ROM (A,B) *See Replacement Note	E.S.D.
IC6005	KS24C011CS	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	AT24C01A10SI	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	C0ZBZ0000015	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	C3EBCC000038	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	KS24C011IS	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	M24C01-MN6	IC, 1K EEP ROM *See Replacement Note	E.S.D.

TRANSISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
Q1001	2SC4533LP.KT	TRANSISTOR SI NPN (A,B,C,D,E,F)	⚠
Q1001	2SC4953LP.KT	TRANSISTOR SI NPN (A,B,C,D,E,F)	⚠
Q1001	2SC5130LF608	TRANSISTOR SI NPN (A,B,C,D,E,F)	⚠
Q1001	2SC4559LP.KT	TRANSISTOR SI NPN (G)	⚠
Q1001	2SC4130LF608	TRANSISTOR SI NPN (G)	⚠
Q1002	2SD1458	TRANSISTOR SI NPN	
Q1002	2SD225900A	TRANSISTOR SI NPN	
Q1051	2SD2159-T	TRANSISTOR SI NPN	
Q1051	2SD1581-T	TRANSISTOR SI NPN	
Q1052	2SD601A-RS	TRANSISTOR SI NPN CHIP	
Q1052	B1ABCF000011	TRANSISTOR SI NPN CHIP	
Q1053	2SD235800A	TRANSISTOR SI NPN CHIP	
Q1053	B1AAQB000002	TRANSISTOR SI NPN CHIP	
Q1080	2SB13980QA	TRANSISTOR SI PNP CHIP (G)	
Q1080	B1BCDC000008	TRANSISTOR SI PNP CHIP (G)	
Q1080	2SB1398-RTA	TRANSISTOR SI PNP CHIP (G)	
Q1081	2SD0601A0L	TRANSISTOR SI NPN CHIP (G)	
Q1081	B1ABCF000011	TRANSISTOR SI NPN CHIP (G)	
Q3001	2SB0709A0L	TRANSISTOR SI PNP CHIP	

Ref. No.	Part No.	Part Name & Description	Remarks
Q3001	B1ADCF000001	TRANSISTOR SI PNP CHIP	
Q3002	2SB709A-RS	TRANSISTOR SI PNP CHIP	
Q3002	B1ADCF000001	TRANSISTOR SI PNP CHIP	
Q3003	2SD601A-RS	TRANSISTOR SI NPN CHIP	
Q3003	B1ABCF000011	TRANSISTOR SI NPN CHIP	
Q3875	2SB0709A0L	TRANSISTOR SI PNP CHIP (E,F,G)	
Q3875	B1ADCF000001	TRANSISTOR SI PNP CHIP (E,F,G)	
Q4001	2SB1218ARS	TRANSISTOR SI PNP CHIP	
Q4001	B1ADCF000063	TRANSISTOR SI PNP CHIP	
Q4002	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q4003	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q4101	2SD601A-RS	TRANSISTOR SI NPN CHIP	
Q4101	B1ABCF000011	TRANSISTOR SI NPN CHIP	
Q4151	UNR521200L	TRANSISTOR SI NPN CHIP (A)	
Q4151	B1GBCFLL0012	TRANSISTOR SI NPN CHIP (A)	
Q4151	MUN5212T1	TRANSISTOR SI NPN CHIP (A)	
Q6001	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q6001	B1ABCF000020	TRANSISTOR SI NPN CHIP	
Q6002	2SB709A-RS	TRANSISTOR SI PNP CHIP	
Q6002	B1ADCF000001	TRANSISTOR SI PNP CHIP	
Q6003	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q6003	B1ABCF000020	TRANSISTOR SI NPN CHIP	
Q6005	2SB709A-RS	TRANSISTOR SI PNP CHIP	
Q6005	B1ADCF000001	TRANSISTOR SI PNP CHIP	
Q6006	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q6006	B1ABCF000020	TRANSISTOR SI NPN CHIP	
Q6007	UNR511L00L	TRANSISTOR SI PNP CHIP (D,G)	
Q6007	B1GDCFGG0005	TRANSISTOR SI PNP CHIP (D,G)	
Q6009	VEKS5707	PHOTO SENSOR UNIT	
Q6010	VEKS5707	PHOTO SENSOR UNIT	

DIODES

Ref. No.	Part No.	Part Name & Description	Remarks
D1001	DB105G	DIODE SI	⚠
D1001	B0EBKR000003	DIODE SI	⚠
D1001	B0EBKR000020	DIODE SI	⚠
D1002	B0HAHP000014	DIODE SI	
D1002	B0HAJP000007	DIODE SI	
D1002	B0HAMP000061	DIODE SI	
D1003	B0HAHP000014	DIODE SI	
D1003	B0HAJP000007	DIODE SI	
D1003	B0HAMP000061	DIODE SI	
D1005	B0HAHP000014	DIODE SI	
D1005	B0HAJP000007	DIODE SI	
D1005	B0HAMP000061	DIODE SI	
D1006	ERB32-01L3	DIODE SI	
D1006	B0HAML000013	DIODE SI	
D1006	B0HAML000014	DIODE SI	
D1006	RGP15GL-5008	DIODE SI	
D1008	ERB81-004V1	DIODE SI	
D1008	B0JAME000049	DIODE SI	
D1008	B0JANE000011	DIODE SI	
D1009	B0JCME000028	DIODE SI	
D1009	B0JCMD000006	DIODE SI	
D1009	B0JCMD000014	DIODE SI	
D1009	MA2YD2300L	DIODE SI	
D1009	SFPJ-53	DIODE SI	
D1015	MA2180LA	DIODE ZENER 18V	⚠
D1015	1N4746A-T	DIODE ZENER 18V	⚠
D1015	1N4746ARL	DIODE ZENER 18V	⚠
D1016	MA2C165001VT	DIODE SI	
D1016	B0AACK000004	DIODE SI	
D1016	1SS119	DIODE SI	
D1017	B0AAML000001	DIODE SI	
D1017	ERA15-01V3	DIODE SI	
D1051	MA4110N-H	DIODE ZENER 11V	
D1080	ERB84-009V1	DIODE SI (G)	
D1080	EK19V1	DIODE SI (G)	
D3006	MAZ40510MF	DIODE ZENER 5.1V	
D3006	HZS5C2TD	DIODE ZENER 5.1V	
D3006	HZS5C3TD	DIODE ZENER 5.1V	
D3007	MAZ40510MF	DIODE ZENER 5.1V	
D3007	HZS5C2TD	DIODE ZENER 5.1V	
D3007	HZS5C3TD	DIODE ZENER 5.1V	
D4209	MA2C165001VT	DIODE SI (B,C,D,E,F,G)	
D4209	B0AACK000004	DIODE SI (B,C,D,E,F,G)	
D4209	1SS119	DIODE SI (B,C,D,E,F,G)	
D6001	VEKS5708	SENSOR LED UNIT	
D6003	MA2C165001VT	DIODE SI	
D6003	B0AACK000004	DIODE SI	
D6003	1SS119	DIODE SI	

RESISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
R1001	VRESC2TK275	CARBON 1/2W 2.7M	⚠
R1001	VRESC2TK275C	CARBON 1/2W 2.7M	⚠
R1001	VRESC2TK275T	CARBON 1/2W 2.7M	⚠
R1003	D0AF334JA038	CARBON 1/2W 330K	
R1004	ERG2SJ333H	METAL OXIDE 2W 33K	
R1005	ERG1SJ560P	METAL OXIDE 1W 56	
R1006	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1007	ERDS2TJ101	CARBON 1/4W 100	
R1008	ERDS2TJ392	CARBON 1/4W 3.9K	
R1010	ERD25FJ100P	CARBON 1/4W 10	⚠
R1010	ERD25FPJ100P	CARBON 1/4W 10	⚠
R1010	VRESF4FJ100P	CARBON 1/4W 10	⚠
R1014	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R1015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1016	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1017	D1BD2431A016	MGF CHIP 2.43K	
R1018	D0HD222ZA002	MGF CHIP 2.2K	
R1019	ERDS2T0	CARBON 1/4W 0	
R1025	ERDS2TJ300	CARBON 1/2W 30	
R1026	ERDS2TJ300	CARBON 1/2W 30	
R1051	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R1052	ERDS2TJ153	CARBON 1/4W 15K	
R1053	ERDS2TJ153	CARBON 1/4W 15K	
R1057	ERDS2TJ331	CARBON 1/4W 330	
R1058	ERDS2TJ104	CARBON 1/4W 100K	
R1080	ERDS2TJ103	CARBON 1/4W 10K (G)	
R1081	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (G)	
R1082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (G)	
R1083	D0AF122JA038	CARBON 1/2W 1.2K (G)	
R3001	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3002	ERDS2TJ561	CARBON 1/4W 560	
R3003	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3004	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3006	ERDS2TJ152	CARBON 1/4W 1.5K	
R3007	ERDS2TJ152	CARBON 1/4W 1.5K	
R3008	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3009	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3022	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3023	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3027	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R3029	ERJ6GEYJ125V	MGF CHIP 1/10W 1.2M	
R3031	ERJ6GEYJ474V	MGF CHIP 1/10W 470K	
R3033	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3034	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3035	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R3036	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3041	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3301	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3302	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3305	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3803	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (E,F,G)	
R3807	ERJ6GEYJ393V	MGF CHIP 1/10W 39K (E,F,G)	

Ref. No.	Part No.	Part Name & Description	Remarks
R3810	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (E,F,G)	
R3811	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (E,F,G)	
R3812	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (E,F,G)	
R3813	ERJ6GEYJ563V	MGF CHIP 1/10W 56K (E,F,G)	
R3822	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (E,F,G)	
R3874	ERJ6GEYJ471V	MGF CHIP 1/10W 470 (E,F,G)	
R3875	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K (E,F,G)	
R4001	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4002	ERJ6GEYJ334V	MGF CHIP 1/10W 330K	
R4003	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R4004	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4005	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R4006	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R4007	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R4008	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R4009	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (A)	
R4010	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (A)	
R4010	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (B,C,D,E,F,G)	
R4011	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4012	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4013	ERJ6GEYJ331V	MGF CHIP 1/10W 330 (A)	
R4014	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R4015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R4017	ERJ6GEYJ101V	MGF CHIP 1/10W 100 (A)	
R4017	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (B,C,D,E,F,G)	
R4018	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K (A)	
R4028	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R4102	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4103	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R4151	ERJ6GEYJ101V	MGF CHIP 1/10W 100 (A)	
R4152	ERJ6GEYJ101V	MGF CHIP 1/10W 100 (A)	
R4153	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A)	
R4154	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A)	
R4155	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A)	
R4156	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A)	
R4157	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A)	
R4158	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A)	
R4161	ERJ6GEYJ223V	MGF CHIP 1/10W 22K (A)	
R4201	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (B,C,D,E,F,G)	
R4202	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (B,C,D,E,F,G)	
R4203	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K (B,C,D,E,F,G)	
R4204	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K (B,C,D,E,F,G)	
R4205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (B,C,D,E,F,G)	
R4206	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (B,C,D,E,F,G)	
R4207	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K (B,C,D,E,F,G)	
R4208	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K (B,C,D,E,F,G)	
R4209	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (B,C,D,E,F,G)	
R4210	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (B,C,D,E,F,G)	
R4213	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (B,C,D,E,F,G)	
R4214	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (B,C,D,E,F,G)	
R4218	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (B,C,D,E,F,G)	
R4223	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (B,C,D,E,F,G)	
R4224	ERJ6GEYJ333V	MGF CHIP 1/10W 33K (B,C,D,E,F,G)	
R4225	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (B,C,D,E,F,G)	

Ref. No.	Part No.	Part Name & Description	Remarks
R4226	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K (B,C,D,E,F,G)	
R4228	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (B,C,D,E,F,G)	
R4453	ERJ6GEYJ333V	MGF CHIP 1/10W 33K (B,C,D,E,F,G)	
R4455	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K (B,C,D,E,F,G)	
R6001	ERDS2TJ101	CARBON 1/4W 100	
R6003	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R6005	ERJ6GEYJ563V	MGF CHIP 1/10W 56K	
R6006	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6007	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6008	ERJ6GEYJ223V	MGF CHIP 1/10W 22K (A,B,G)	
R6010	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6012	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6019	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6024	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6026	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6027	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R6028	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6029	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R6030	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6033	ERDS2TJ681	CARBON 1/4W 680	
R6037	ERJ6GEYJ391V	MGF CHIP 1/10W 390	
R6038	ERDS2TJ560T	CARBON 1/4W 56 (D,G)	
R6051	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K (G)	
R6052	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6057	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6059	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6060	ERJ6GEYJ105V	MGF CHIP 1/10W 1M (A,B,C,E,F)	
R6060	ERJ6GEYJ475V	MGF CHIP 1/10W 4.7M (D,G)	
R6062	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6063	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6064	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6066	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6069	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6070	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6071	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6072	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6073	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6074	ERDS2TJ272	CARBON 1/4W 2.7K	
R6075	ERJ6GEYJ223V	MGF CHIP 1/10W 22K (A,B,G)	
R6078	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6080	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6085	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6086	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6087	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6109	ERJ6GEYJ183V	MGF CHIP 1/10W 18K	
R6110	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6115	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6116	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6202	ERJ6GEYJ274V	MGF CHIP 1/10W 270K	
R6203	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6204	ERJ6GEYJ334V	MGF CHIP 1/10W 330K	
R6205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6228	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	

Ref. No.	Part No.	Part Name & Description	Remarks
R6231	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6232	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R6233	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6234	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (E,F,G)	
R6236	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6237	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6238	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6239	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6301	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R6302	ERDS2TJ3R3	CARBON 1/4W 3.3	
R6303	ERDS2TJ470	CARBON 1/4W 47	
R6310	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6311	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R6313	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6314	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R6315	ERJ6GEYJ123V	MGF CHIP 1/10W 12K	
R6316	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6317	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R6319	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6320	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R6321	ERJ6GEYJ123V	MGF CHIP 1/10W 12K	
R6521	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R7001	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (A)	

CAPACITORS

Ref. No.	Part No.	Part Name & Description	Remarks
C1001	ECKATS103MF	CERAMIC 250V 0.01UF	⚠
C1001	ECKETS103MF	CERAMIC 125V 0.01UF	⚠
C1001	VCKST3G103MY	CERAMIC 250V 0.01UF	⚠
C1001	VCKSU3D103MY	CERAMIC 125V 0.01UF	⚠
C1002	ECKATS332ME8	CERAMIC 250V 3300PF	⚠
C1002	ECKDNB332ME8	CERAMIC 125V 3300PF	⚠
C1002	ECKETS332ME8	CERAMIC 125V 3300PF	⚠
C1002	VCKST3G332MX	CERAMIC 250V 3300PF	⚠
C1002	VCKSU3D332MX	CERAMIC 125V 3300PF	⚠
C1003	ECKATS332ME8	CERAMIC 250V 3300PF	⚠
C1003	ECKDNB332ME8	CERAMIC 125V 3300PF	⚠
C1003	ECKETS332ME8	CERAMIC 125V 3300PF	⚠
C1003	VCKST3G332MX	CERAMIC 250V 3300PF	⚠
C1003	VCKSU3D332MX	CERAMIC 125V 3300PF	⚠
C1004	ECEA2DU820YE	ELECTROLYTIC 200V 82UF	⚠
C1004	F2A2D8200001	ELECTROLYTIC 220V 82UF	⚠
C1004	F2A2D8200003	ELECTROLYTIC 200V 82UF	⚠
C1004	VCESR2D820XE	ELECTROLYTIC 200V 82UF	⚠
C1005	ECA2DHG4R7B	ELECTROLYTIC 200V 4.7UF	
C1006	ECKR2H221KB5	CERAMIC 500V 220PF	
C1007	ECJ2VB1C224K	C CHIP 16V 0.22UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C1009	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1010	ECJ2VC1H101J	C CHIP 50V 100PF	
C1011	ECA1HHG4R7I	ELECTROLYTIC 50V 4.7UF	
C1012	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1013	ECA1EM331B	ELECTROLYTIC 25V 330UF (A,B,C,D,E,F)	
C1013	ECA1EM102B	ELECTROLYTIC 25V 1000UF (G)	
C1016	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1017	ECA0JM102B	ELECTROLYTIC 6.3V 1000UF	
C1018	ECJ2VB1E104K	C CHIP 25V 0.1UF	
C1019	ECA0JM471	ELECTROLYTIC 6.3V 470UF	
C1027	ECKATS103MF	CERAMIC 250V 0.01UF	⚠
C1027	ECKETS103MF	CERAMIC 125V 0.01UF	⚠
C1027	VCKST3G103MY	CERAMIC 250V 0.01UF	⚠
C1027	VCKSU3D103MY	CERAMIC 125V 0.01UF	⚠
C1029	ECJ2VC1H101J	C CHIP 50V 100PF	
C1030	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1051	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C1052	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C1058	ECEA0JEE101	ELECTROLYTIC 6.3V 100UF	
C1059	ECEA1CKA220	ELECTROLYTIC 16V 22UF	
C1060	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C1080	EEUFD1V331LB	ELECTROLYTIC 35V 330UF (G)	
C1082	EEUFD1V331LB	ELECTROLYTIC 35V 330UF (G)	
C3001	ECA0JM471	ELECTROLYTIC 6.3V 470UF	
C3003	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C3004	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3014	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3015	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3017	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3018	ECJ2VC1H181J	C CHIP 50V 180PF	
C3019	ECJ2VC1H560J	C CHIP 50V 56PF	
C3021	ECJ2VF1C224Z	C CHIP 16V 0.22UF	
C3022	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3023	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3024	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3025	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3026	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3027	ECJ2VF1C224Z	C CHIP 16V 0.22UF	
C3028	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3029	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3030	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3031	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3032	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3033	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3034	ECJ2VF1C224Z	C CHIP 16V 0.22UF	
C3035	ECJ2VC1H680J	C CHIP 50V 68PF	
C3036	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3037	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C3038	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3039	ECJ2VB1H822K	C CHIP 50V 8200PF	
C3043	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3044	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3045	ECJ2VF1C474Z	C CHIP 16V 0.47UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C3047	ECJ2VC1H181J	C CHIP 50V 180PF	
C3048	ECJ2VC1H560J	C CHIP 50V 56PF	
C3049	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3050	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3051	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3052	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3053	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3054	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3055	ECJ2VB1H392K	C CHIP 50V 3900PF	
C3056	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3062	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3101	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3102	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3104	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3105	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3106	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3108	ECJ2VB1H102K	C CHIP 50V 1000PF	
C3109	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3302	ECEA1HKSR47	ELECTROLYTIC 50V 0.47UF	
C3303	ECJ2VC1H121J	C CHIP 50V 120PF	
C3306	ECEA1HKSR47	ELECTROLYTIC 50V 0.47UF	
C3308	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3501	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3502	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3503	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3504	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3505	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3506	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3507	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3508	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3514	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3515	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3517	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3518	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3519	ECJ2VB1H102K	C CHIP 50V 1000PF	
C3801	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF (E,F,G)	
C3802	ECJ2VF1H103Z	C CHIP 50V 0.01UF (E,F,G)	
C3803	ECJ2VB1H332K	C CHIP 50V 3300PF (E,F,G)	
C3804	ECJ2VF1E104Z	C CHIP 25V 0.1UF (E,F,G)	
C3805	ECJ2VF1H103Z	C CHIP 50V 0.01UF (E,F,G)	
C3806	ECJ2VB1H392K	C CHIP 50V 3900PF (E,F,G)	
C3807	ECJ2VB1H103K	C CHIP 50V 0.01UF (E,F,G)	
C3808	ECJ2VB1E104K	C CHIP 25V 0.1UF (E,F,G)	
C3811	ECJ2VB1H103K	C CHIP 50V 0.01UF (E,F,G)	
C3812	ECJ2VB1H102K	C CHIP 50V 1000PF (E,F,G)	
C3815	ECJ2VB1E104K	C CHIP 25V 0.1UF (E,F,G)	
C3816	ECUV1E154KBN	C CHIP 25V 0.15UF (E,F,G)	
C3817	ECJ2VB1H103K	C CHIP 50V 0.01UF (E,F,G)	
C3818	ECJ2VB1H103K	C CHIP 50V 0.01UF (E,F,G)	
C3819	ECJ2VB1H103K	C CHIP 50V 0.01UF (E,F,G)	
C3820	ECJ2VF1E104Z	C CHIP 25V 0.1UF (E,F,G)	
C3821	ECJ2VC1H390J	C CHIP 50V 39PF (E,F,G)	
C3822	ECEA1HKA010	ELECTROLYTIC 50V 1UF (E,F,G)	
C3825	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF (E,F,G)	

Ref. No.	Part No.	Part Name & Description	Remarks
C3826	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF (E,F,G)	
C3828	ECJ2VC1H101J	C CHIP 50V 100PF (E,F,G)	
C3830	ECJ2VB1E563K	C CHIP 25V 0.056UF (E,F,G)	
C4001	ECJ2VF1C224Z	C CHIP 16V 0.22UF	
C4002	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4003	ECJ2VB1H272K	C CHIP 50V 2700PF	
C4004	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C4005	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C4006	ECJ2VB1H102K	C CHIP 50V 1000PF	
C4007	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C4008	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C4009	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4010	ECJ2VB1E273K	C CHIP 25V 0.027UF	
C4011	ECJ2VB1H822K	C CHIP 50V 8200PF	
C4012	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4013	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4014	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4017	ECJ2VB1H103K	C CHIP 50V 0.01UF (B,C,D,E,F,G)	
C4018	ECEA1HKA010	ELECTROLYTIC 50V 1UF (A)	
C4102	ECQB1562JF	POLYESTER 100V 5600PF	
C4103	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C4104	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C4106	ECEA1CKS220	ELECTROLYTIC 16V 22UF	
C4151	ECEA1HKA010	ELECTROLYTIC 50V 1UF (A)	
C4152	ECEA1HKA010	ELECTROLYTIC 50V 1UF (A)	
C4153	ECEA1HKA010	ELECTROLYTIC 50V 1UF (A)	
C4154	ECEA1CKA101	ELECTROLYTIC 16V 100UF (A)	
C4155	ECJ2VF1E104Z	C CHIP 25V 0.1UF (A)	
C4201	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF (B,C,D,E,F,G)	
C4202	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF (B,C,D,E,F,G)	
C4203	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF (B,C,D,E,F,G)	
C4204	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF (B,C,D,E,F,G)	
C4205	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4206	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4207	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4208	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4209	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4210	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4211	ECJ2VB1H153K	C CHIP 50V 0.015UF (B,C,D,E,F,G)	
C4212	ECJ2VB1H153K	C CHIP 50V 0.015UF (B,C,D,E,F,G)	
C4213	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4214	ECEA1CKA101	ELECTROLYTIC 16V 100UF (B,C,D,E,F,G)	
C4216	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4217	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF (B,C,D,E,F,G)	
C4218	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4219	ECEA1HKA010	ELECTROLYTIC 50V 1UF (B,C,D,E,F,G)	
C4227	ECJ2VF1C224Z	C CHIP 16V 0.22UF (B,C,D,E,F,G)	
C4229	ECJ2VF1H103Z	C CHIP 50V 0.01UF (B,C,D,E,F,G)	
C4230	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF (B,C,D,E,F,G)	
C4451	ECJ2VB1H103K	C CHIP 50V 0.01UF (B,C,D,E,F,G)	
C4452	ECJ2VB1H103K	C CHIP 50V 0.01UF (B,C,D,E,F,G)	
C4455	ECJ2VB1E104K	C CHIP 25V 0.1UF (B,C,D,E,F,G)	
C4456	ECJ2VB1E104K	C CHIP 25V 0.1UF (B,C,D,E,F,G)	
C4459	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF (B,C,D,E,F,G)	

Ref. No.	Part No.	Part Name & Description	Remarks
C4901	ECEA1HKA010	ELECTROLYTIC 50V 1UF (B,C,D,E,F,G)	
C4902	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF (B,C,D,E,F,G)	
C4903	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF (B,C,D,E,F,G)	
C4904	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF (B,C,D,E,F,G)	
C4905	ECEA1CKA100	ELECTROLYTIC 16V 10UF (B,C,D,E,F,G)	
C4906	ECEA1HKA010	ELECTROLYTIC 50V 1UF (B,C,D,E,F,G)	
C4911	ECJ2VB1E223K	C CHIP 25V 0.022UF (B,C,D,E,F,G)	
C4912	ECJ2VB1E104K	C CHIP 25V 0.1UF (B,C,D,E,F,G)	
C4913	ECJ2VB1H103K	C CHIP 50V 0.01UF (B,C,D,E,F,G)	
C4917	ECJ2VB1E104K	C CHIP 25V 0.1UF (B,C,D,E,F,G)	
C4918	ECJ2VB1E104K	C CHIP 25V 0.1UF (B,C,D,E,F,G)	
C4919	ECJ2VB1E104K	C CHIP 25V 0.1UF (B,C,D,E,F,G)	
C4920	ECJ2VB1E223K	C CHIP 25V 0.022UF (B,C,D,E,F,G)	
C6001	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6003	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6005	ECJ2VC1H100C	C CHIP 50V 10PF	
C6006	ECJ2VC1H090C	C CHIP 50V 9PF	
C6011	ECJ2VC1H101J	C CHIP 50V 100PF (G)	
C6016	ECEA0JKA331	ELECTROLYTIC 6.3V 330UF (D,G)	
C6019	ECEA1CKA100	ELECTROLYTIC 16V 10UF (A,B,C,E,F)	
C6019	ECA0JM101B	ELECTROLYTIC 6.3V 100UF (D,G)	
C6021	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C6024	ECJ2VC1H101J	C CHIP 50V 100PF (G)	
C6026	ECJ2VB1H102K	C CHIP 50V 1000PF	
C6027	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6033	ECJ2VF1H104Z	C CHIP 50V 0.1UF	
C6201	ECJ2VB1H332K	C CHIP 50V 3300PF	
C6202	ECJ2VB1H102K	C CHIP 50V 1000PF	
C6203	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C6204	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C6216	ECJ2VB1H103K	C CHIP 50V 0.01UF (E,F,G)	
C6217	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6218	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C6221	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C6223	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C6224	VCESAM0J331I	ELECTROLYTIC 6.3V 330UF	
C6228	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6231	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6232	ECA1HM470I	ELECTROLYTIC 50V 47UF	
C6233	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C6302	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6303	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6304	VCESAM0J331I	ELECTROLYTIC 6.3V 330UF	
C6307	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C7001	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C7005	ECJ2VB1E183K	C CHIP 25V 0.018UF (A)	
C7010	ECJ2VB1H102K	C CHIP 50V 1000PF	

COILS

Ref. No.	Part No.	Part Name & Description	Remarks
L1001	ELF15N005A	LINE FILTER 0.5A 18MH	⚠
L1001	ELF18D290A	LINE FILTER 0.5A 18MH	⚠
L1001	G0B183D00001	LINE FILTER 0.5A 18MH	⚠
L1001	J0HBLD000001	LINE FILTER 0.5A 18MH	⚠
L1001	VLQS0167	LINE FILTER 0.5A 18MH	⚠
L1001	VLQS0170	LINE FILTER 0.6A 18MH	⚠
L1002	VLQSAB7D220K	COIL 22UH	
L1003	VLQSAB7D100K	COIL 10UH	
L1006	J0JHB0000021	FILTER	
L3001	ELESN470KA	COIL 47UH	
L3014	G0C330KA0045	COIL 33UH	
L3016	ELESN330KA	COIL 33UH	
L3018	ELESN470KA	COIL 47UH	
L3101	ELESN101KA	COIL 100UH	
L3506	ELESN101KA	COIL 100UH	
L3507	ELESN101KA	COIL 100UH	
L3801	ELESN101KA	COIL 100UH (E,F,G)	
L3802	ELESN470KA	COIL 47UH (E,F,G)	
L4001	ELELN153KA	COIL 15MH	
L4002	ELESN101KA	COIL 100UH	
L4101	ELESN471KA	COIL 470UH	
L4201	ELESN101KA	COIL 100UH (B,C,D,E,F,G)	
L4451	ELESN101KA	COIL 100UH (B,C,D,E,F,G)	
L6201	ELEXT101KE04	COIL 100UH	
L6302	ELESN470KA	COIL 47UH	
L7003	G0C101KA0045	COIL 100UH	

CRYSTAL OSCILLATOR

Ref. No.	Part No.	Part Name & Description	Remarks
X3010	VSXS0195	CRYSTAL OSCILLATOR	
X6001	VSXS0232-TB	CRYSTAL OSCILLATOR	

PIN HEADERS

Ref. No.	Part No.	Part Name & Description	Remarks
P3501	LSJWM6N050LL	CONNECTOR CABLE W/PLUG,DC 9V (A)	
P3501	LSJWM9N050LL	CONNECTOR CABLE W/PLUG,DC 9V (B,C,D,E,F,G)	
P3502	LSEK0407	SHIELD PLATE UNIT	
P4001	VJSS0888	FE CONNECTOR 2P	
P4002	LSJWM6N130LL	CONNECTOR CABLE W/PLUG,DC 9V	
P6201	K1KA12A00234	CONNECTOR 12P	

SWITCHES

Ref. No.	Part No.	Part Name & Description	Remarks
SW6001	LSSH0002	LEAF SWITCH-SAFETY TAB	
SW6002	LSSS0012	MODE SELECT SWITCH	
SW6301	EVQ11A09K	PUSH SWITCH (D)	
SW6303	EVQ11A09K	PUSH SWITCH	
SW6304	EVQ11A09K	PUSH SWITCH	
SW6305	EVQ11A09K	PUSH SWITCH	
SW6306	EVQ11A09K	PUSH SWITCH (C,D,E,F,G)	
SW6307	EVQ11A09K	PUSH SWITCH (D)	
SW6310	EVQ11A09K	PUSH SWITCH (A,B)	
SW6311	EVQ11A09K	PUSH SWITCH (A,B,C,E,F,G)	
SW6312	EVQ11A09K	PUSH SWITCH (D)	
SW6314	EVQ11A09K	PUSH SWITCH	
SW6315	EVQ11A09K	PUSH SWITCH (A,B,C,E,F,G)	
SW6316	EVQ11A09K	PUSH SWITCH (D)	
SW6317	EVQ11A09K	PUSH SWITCH (A,B,C,E,F,G)	

FUSE& PROTECTOR

Ref. No.	Part No.	Part Name & Description	Remarks
F1001	VSFS0003A16	FUSE 125V 1.6A	⚠
F1001	K5D162AB0003	FUSE 125V 1.6A	⚠
F1001	K5D162AQ0004	FUSE 125V 1.6A	⚠
F1001	K5D162ADA001	FUSE 125V 1.6A	⚠
PR1001	UNH000600A	IC PROTECTOR 1.5A	⚠
PR1001	B1ZAZ0000040	IC PROTECTOR 1.5A	⚠
PR1001	LSSF009A25E	IC PROTECTOR 1.5A	⚠
PR1002	UNH000600A	IC PROTECTOR 1.5A	⚠
PR1002	B1ZAZ0000040	IC PROTECTOR 1.5A	⚠
PR1002	LSSF009A25E	IC PROTECTOR 1.5A	⚠
PR1080	UNH000600A	IC PROTECTOR 1.5A (G)	⚠
PR1080	B1ZAZ0000040	IC PROTECTOR 1.5A (G)	⚠
PR1080	LSSF009A25E	IC PROTECTOR 1.5A (G)	⚠

TRANSFORMER

Ref. No.	Part No.	Part Name & Description	Remarks
T1001	ETS28AD2J3AC	SW TRANSFORMER (A,B,C,D,E,F)	⚠
T1001	ETS28AD2J3NC	SW TRANSFORMER (A,B,C,D,E,F)	⚠
T1001	LSTP0105	SW TRANSFORMER (A,B,C,D,E,F)	⚠
T1001	LSTP0105-1	SW TRANSFORMER (A,B,C,D,E,F)	⚠
T1001	VTPS0042	SW TRANSFORMER (A,B,C,D,E,F)	⚠
T1001	VTPS0042-1	SW TRANSFORMER (A,B,C,D,E,F)	⚠
T1001	ETS28AD365AC	SW TRANSFORMER (G)	⚠
T4101	EIQ7QF018Q	OSC TRANSFORMER (A,G)	
T4101	LSLT0051	TRANSFORMER (B,C,D,E,F)	

JACKS

Ref. No.	Part No.	Part Name & Description	Remarks
JK3001	LSJH0028	AUDIO/VIDEO JACK SOCKET (A)	
JK3001	K2HA608B0002	Hi-Fi AUDIO/VIDEO JACK SOCKET (B,C,D,E,F,G)	
JK3002	K2HA104B0007	FRONT AUDIO/VIDEO JACK SOCKET (A)	
JK3002	K2HA306B0058	AUDIO/VIDEO JACK SOCKET (B,C,D,E,F,G)	

MISCELLANEOUS

Ref. No.	Part No.	Part Name & Description	Remarks
711	LSSZ0004	INFRARED RECEIVER UNIT	
716	B3CKS0000001	LED DISPLAY PANEL	
741	LSJA0360	AC CORD W/PLUG,AC 120V	⚠
741	LSJA0358	AC CORD W/PLUG,AC 120V	⚠
741	LSJA0359	AC CORD W/PLUG,AC 120V	⚠
741	LSJA0361	AC CORD W/PLUG,AC 120V	⚠
741	LSJA0348	AC CORD W/PLUG,AC 120V	⚠
743	ENG56717G1	TUNER,UHF/VHF NR (A,B,E,F)	
743	ENG56717G1L	TUNER,UHF/VHF NR (C,D,G)	
771	EYF52BC	FUSE HOLDER	

12. SCHEMATIC DIAGRAMS FOR PRINTING WITH LETTER SIZE